FIFTH

ANNUAL REPORT ON

Stress

"The history of science
demonstrates beyond a doubt
that the really revolutionary and
significant advances
come not from empiricism
but from new theories"

JAMES B CONANT

OTHER BOOKS
BY HANS SELYE

Stress (The Physiology and Pathology of Exposure to Stress), 1950
First Annual Report on Stress, 1951
Second Annual Report on Stress' 1952 (in collaboration with A Horava)
Third Annual Report on Stress 1953 (in collaboration with A Horava)
Fourth Annual Report on Stress, 1954 (in collaboration with G Heuser)
'The Story of the Adaptation Syndrome (Told in the Form of Informal Illustrated Lectures) 1952
Textbook of Endocrinology, 2nd Edition 1949
The Steroids (4 Volumes) in Encyclopedia of Endocrinology, 1943
Ovarian Tumors (2 Volumes) in Encyclopedia of Endocrinology 1946

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FIFTH ANNUAL REPORT ON Stress 1955-56

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THIS VOLUME REPRESENTS THE FIFTH OF A SERIES OF ANNUAL SUPPLEMENTS TO THE BOOK

Stress

THE PHYSIOLOGY AND PATHOLOGY OF EXPOSURE TO STRESS

BY HANS SELYE

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SPECIAL PHYSIOLOGY AND PATHOLOGY OF STRESS IN 1955

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INTRODUCTION*

The scope of the Annual Reports — These volumes are published with the hope that they will act as guides to the entire literature on stress and that they will help to correlate all pertinent facts even those which may appear to be quite unrelated

The rapidity with which this field develops is strikingly illustrated by comparing the pertinent reviews published by our group in the years 1937 (Selye 3879S/37) 1946 (Selye B1204/46) and 1950 (Selye B40000/50) In the first of these we were able to quote only 30 in the second 698 and in the third more than 5600 references on what appeared to be pertinent subjects at these times Then the decision was taken to publish the "Annual Reports on Stress" These are meant to act as annual supplements to keep the monograph *Stress* up to date without having to publish new editions of it

The following table will help to survey the volume of literature which had to be classified and correlated to accomplish this aim

Title	Pages	References
STRESS by H Selye	1027	5673
AROS 1951 by H Selye	644	3592
AROS 1952 by H Selye and A Horava	526	5265
AROS 1953 by H Selye and A Horava	632	5741
AROS 1954 by H Selye and G Heuser	749	4828
AROS 1955 by H Selye and G Heuser	816	5698

With the ever increasing volume of scientific production it becomes more important to systematize the data published throughout the world in different languages and in journals devoted to separate specialties of medicine This strikes us as particularly necessary in the fields of biologic stress the General Adaptation Syndrome (G A S) and the so called "adaptive hormones" Indeed here the critical evaluation of newly acquired data and their prompt integration into the body of classic knowledge is likely to promote progress even more than the discovery of any but the most fundamental new facts We believe this to be so because the subject is comparatively new and yet has already affected almost every aspect of medicine Within the comparatively short span of the last 19 years during which the stress concept has taken shape and particularly during the last

* In these annual reports we shall refer to the volume *Stress* – ("*The physiology and pathology of exposure to stress a treatise based on the concept of the General Adaptation Syndrome and the Diseases of Adaptation*) by Hans Selye Acta Inc Medical Publishers Montreal Canada 1950 merely by the designation *Stress* when the condition of stress is meant the word will not be italicized

Reference to the volume *First Annual Report on Stress* by Hans Selye Acta Inc Medical Publishers Montreal Canada 1951 will be made by the designation AROS 1951 The volumes *Second Annual Report on Stress* and *Third Annual Report on Stress* by Hans Selye and Alex ander Horava and *Fourth Annual Report on Stress* by Hans Selye and Gunnar Heuser Acta Inc Medical Publishers Montreal Canada 1952 1953 and 1954 will be designated by the abbreviations AROS 1952 AROS 1953 and AROS 1954

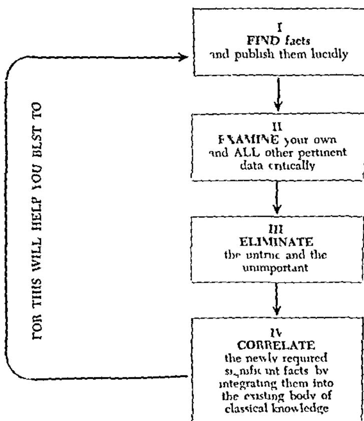
six years since ACTH and glucocorticoids have become generally available almost every physician has found it necessary to familiarize himself with some facet of this subject Consequently most people who are interested in it even many of the leading investigators of individual stress problems are newcomers who have not yet had the time to absorb this branch of science as an entity

Thus the entire series offers a classified guide system to approximately 30 000 references on stress the adaptation syndrome and the adaptive hormones

Since an ever increasing proportion of all the current endocrinological research (both theoretical and clinical) is concerned with the adaptive hormones (ACTH corticoids STH adrenaline noradrenaline) the scope of these reviews is, by no means, limited to stress research They also cover such cognate subjects as for instance the bioassay of corticoids the metabolism of adrenaline drugs affecting neoplastic growth inflammation (in connection with local stress) or hypertension (viewed as a disease of adaptation) All these topics are surveyed by us from the viewpoint of their possible relevance to stress research but the ready availability of the information contained in the quoted papers is equally useful to those whose interest is in other fields of endocrinology

To accomplish their two major aims information and integration, these "Annual Reports on Stress" are written as a combination of an extensive classified index of new facts with a concise evaluation of the principal data

The following self explanatory graph may perhaps express more concisely than this discussion those views which induced us to undertake the publication of these Reports



Special articles Several colleagues expressed the view that in a series of mono graphs guided by these considerations it would be most convenient and instructive to include independent special reviews on selected timely subjects

These represent entirely independent surveys not limited — as the rest of the volume — to the discussion of papers published during the current year For the sake of convenience here the references will be listed immediately following the corresponding text even if they have already been cited in previous volumes of the *Stress* series The yellow pages at the end of each AROS will continue to be reserved for new articles thus forming an uninterrupted set of annual listings of the publications concerned with stress and the adaptive hormones

To obviate the one side presentation of data a special effort is made every year to convince some of the most distinguished opponents of views expressed in other parts of these volumes also to contribute summaries of their own concepts for the section "Special Articles"

We hope the readers will find that every year this section represents a balanced and highly authoritative selection of views on stress and allied topics

The present volume contains the following articles

"Primary Aldosteronism A New Clinical Entity" by Jerome W Conn M D and Lawrence H Louis Sc D Division of Endocrinology and Metabolism Department of Internal Medicine University of Michigan Medical School Ann Arbor Michigan U S A

"Hormonal Influences on Inflammation and Detoxification" by Thomas F Dougherty Ph D and R D Higginbotham Ph D Department of Anatomy College of Medicine University of Utah Salt Lake City Utah U S A

Stress and Catechol Hormones" by U S von Euler M D Professor Fysiologiska Institutionen Karolinska Institutet Stockholm Sweden

"Adrenal Influences upon the Stomach and the Gastric Response to Stress" by S J Gray M D Ph D C G Ramsey M D R Villarreal M D and L J Krakauer M D Medical Clinic Peter Bent Brigham Hospital and the Department of Medicine Harvard Medical School Boston Massachusetts U S A

"The Role of the Adrenal Cortex in the Etiology of Disease by D J Ingle Ph D The University of Chicago The Ben May Laboratory for Cancer Research Chicago Ill U S A

"Adrenocortical Secretion and Factors Affecting that Secretion by D H Nelson M D Department of Medicine Peter Bent Brigham Hospital Boston Mass U S A

"Neurosecretion" by Ernst Scharrer Ph D M D Professor and Chairman of the Department of Anatomy Albert Einstein College of Medicine New York N Y U S A

Some Observations on Psychiatric Stress in Infancy" by R A Spitz M D New York Psychoanalytic Institute and Lenox Hill Hospital New York N Y U S A

Cortisone in Relation to Lymphoid Tissue and Immunity by Herbert C Stoerk M D Merck Institute for Therapeutic Research Rahway N J U S A

understanding that was out of the question) I hastened with all possible expedition fearing that I might forget it to my Jansenist friend and accosted him immediately after our first salutations with Tell me pray if you admit *the proximate power?* He smiled and replied coldly Tell me yourself in what sense you understand it and I may then inform you what I think of it As my knowledge did not extend quite so far I was at a loss what reply to make and yet rather than lose the object of my visit I said at random Why I understand it in the sense of the Molinists To which of the Molinists do you refer me? replied he with the utmost coolness I referred him to the whole of them together as forming one body and animated by one spirit

You know very little about the matter returned he So far are they from being united in sentiment that some of them are diametrically opposed to each other But being all united in the design to ruin M Arnauld they have resolved to agree on this term *proximate* which both parties might use indiscriminately though they understand it diversely that thus by a similarity of language and an apparent conformity they may form a large body and get up a majority to crush him *with the greater certainty*

This reply filled me with amazement but without imbibing these impressions of the malicious designs of the Molinists which I am unwilling to believe on his word and with which I have no concern I set myself simply to ascertain the various senses which they give to that mysterious word *proximate* I would enlighten you on the subject with all my heart he said but you would discover in it such a mass of contrariety and contradiction that you would hardly believe me You would suspect me To make sure of the matter you had better learn it from some of themselves and I shall give you some of their addresses You have only to make a separate visit to one called M le Moine and to Father Nicolai

I have no acquaintance with any of these persons said I

Let me see then he replied if you know any of those whom I shall name to you they all agree in sentiment with M le Moine

I happened in fact to know some of them

Well let us see if you are acquainted with any of the Dominicans whom they call the New Thomists for they are all the same with Father Nicolai

I knew some of them also whom he named and resolved to profit by this council and to investigate the matter I took my leave of him and went immediately to one of the disciples of M le Moine I begged him to inform me what it *was to have the proximate power of doing a thing*

It is easy to tell you that he replied *it is merely to have all that is necessary for doing it in such a manner that nothing is wanting to performance*

And so said I to have the proximate power of crossing a river for example is to have a boat boatmen oars and all the rest so that nothing is wanting?

Exactly so said the monk

And to have the proximate power of *seeing* continued I must be to have good eyes and the light of day for a person with good sight in the dark would not have the proximate power of seeing according to you as he would want the light without which one cannot see?

Precisely said he

And consequently returned I when you say that all the righteous have the proximate power of observing the commandments of God you mean that they

have always all the grace necessary for observing them, so that nothing is wanting to them on the part of God "

' Stay there," he replied, they have always all that is necessary for observing the commandments, or at least for asking it of God "

'I understand you," said I, they have all that is necessary for praying to God to assist them, without requiring any new grace from God to enable them to pray "

You have it now, ' he rejoined

' But is it not necessary that they have an efficacious grace, in order to pray to God? '

No,' said he, "not according to M le Moine "

To lose no time, I went to the Jacobins, and requested an interview with some whom I knew to be New Thomists, and I begged them to tell me what *proximate power* was "Is it not, ' said I, that power to which nothing is wanting in order to act? '

'No, "said they

Indeed! fathers," said I, "if anything is wanting to that power, do you call it *proximate?* Would you say, for instance, that a man in the night time, and without any light, had the proximate power of seeing?

Yes, indeed, he would have it, in our opinion, if he is not blind

I grant that, ' said I, "but M le Moine understands it in a different manner "

' Very true, ' they replied, 'but so it is that we understand it "

' I have no objections to that," I said, ' for I never quarrel about a name, provided I am apprised of the sense in which it is understood But I perceive from this that, when you speak of the righteous having always the proximate power of praying to God, you understand that they require another supply for praying, without which they will never pray

Most excellent! exclaimed the good fathers, embracing me, exactly the thing, for they must have, besides, an efficacious grace bestowed upon all, and which determines their wills to pray, and it is heresy to deny the necessity of that efficacious grace in order to pray '

' Most excellent! cried I, in return, "but, according to you, the Jansenists are Catholics, and M le Moine a heretic, for the Jansenists maintain that, while the righteous have power to pray, they require nevertheless an efficacious grace, and this is what you approve M le Moine, again, maintains that the righteous may pray without efficacious grace, and this is what you condemn

Ay," said they, but M le Moine calls that power *proximate power*

How now! fathers,' I exclaimed, this is merely playing with words, to say that you are agreed as to the common terms which you employ, while you differ with them as to the sense of these terms '

The fathers made no reply, and at this juncture, who should come in but my old friend, the disciple of M le Moine! I regarded this at the time as an extraordinary piece of good fortune, but I have discovered since then that such meetings are not rare—that, in fact, they are constantly mixing in each other s society

I know a man, ' said I, addressing myself to M le Moine s disciple, who holds that all the righteous have always the power of praying to God, but that, notwithstanding this, they will never pray without an efficacious grace which determines them, and which God does not always give to all the righteous Is he a heretic? '

Stay said the doctor you might take me by surprise Let us go cautiously to work *Distinguo* If he call that power *proximate power* he will be a Thomist and therefore a Catholic if not he will be a Jansenist and therefore a heretic

He calls it neither *proximate* nor *non proximate* said I

Then he is a heretic quoth he I refer you to these good fathers if he is not

I did not appeal to them as judges for they had already nodded assent but I said to them He refuses to admit that word *proximate* because he can meet with nobody who will explain it to him

Upon this one of the fathers was on the point of offering his definition of the term when he was interrupted by M le Moine s disciple who said to him Do you mean then to renew our broils? Have we not agreed not to explain that word *proximate* but to use it on both sides without saying what it signifies? To this the Jacobin gave his assent

I was thus let into the whole secret of their plot and rising to take my leave of them I remarked Indeed fathers I am much afraid this is nothing better than pure chicanery and whatever may be the result of your convocations I venture to predict that though the censure should pass peace will not be established For though it should be decided that the syllables of that word *proximate* should be pronounced who does not see that the meaning not being explained each of you will be disposed to claim the victory? The Jacobins will contend that the word is to be understood in their sense M le Moine will insist that it must be taken in his and thus there will be more wrangling about the explanation of the word than about its introduction For after all there would be no great danger in adopting it without any sense seeing it is through the sense only that it can do any harm But it would be unworthy of the Sorbonne and of theology to employ equivocal and captious terms without giving any explanation of them In short fathers tell me I entreat you for the last time what is necessary to be believed in order to be a good Catholic?

You must say they all vociferated simultaneously that all the righteous have the *proximate power* abstracting from it all sense—from the sense of the Thomists and the sense of other divines

That is to say I replied in taking leave of them that I must pronounce that word to avoid being the heretic of a name For pray is this a Scripture word? No said they Is it a word of the Fathers the Councils or the Popes? No Is the word then used by St Thomas? No What necessity therefore is there for using it since it has neither the authority of others nor any sense of itself? You are an opinionative fellow said they but you shall say it or you shall be a heretic and M Arnauld into the bargain for we are the majority and should it be necessary we can bring a sufficient number of Cordeliers into the field to carry the day

On hearing this solid argument I took my leave of them to write you the foregoing account of my interview from which you will perceive that the following points remain undisputed and uncondemned by either party *First* That grace is not given to all men *Second* That all the righteous have always the power of obeying the divine commandments *Third* That they require nevertheless in order to obey them and even to pray an efficacious grace which invincibly determines their will *Fourth* That this efficacious grace is not always granted to all the right

eous, and that it depends on the pure mercy of God So that, after all, the truth is safe, and nothing runs any risk but that word without the sense, *proximate*

Happy the people who are ignorant of its existence! happy those who lived before it was born! for I see no help for it, unless the gentlemen of the Acadamy, by an act of absolute authority, banish that barbarous term, which causes so many divisions, from beyond the precincts of the Sorbonne Unless this be done, the censure appears certain, but I can easily see that it will do no other harm than diminish the credit of the Sorbonne, and deprive it of that authority which is so necessary to it on other occasions

Meanwhile, I leave you at perfect liberty to hold by the word *proximate* or not, just as you please, for I love you too much to persecute you under that pretext If this account is not displeasing to you, I shall continue to apprise you of all that happens I am, &c

LETTER II

Paris, *January* 29, 1656

SIR,

Just as I had sealed up my last letter, I received a visit from our old friend M N—— Nothing could have happened more luckily for my curiosity, for he is thoroughly informed in the questions of the day and is completely in the secret of the Jesuits, at whose houses, including those of their leading men, he is a constant visitor After having talked over the business which brought him to my house, I asked him to state, in a few words, what were the points in dispute between the two parties

He immediately complied, and informed me that the principal points were two —the *first* about the *proximate power*, and the *second* about *sufficient grace* I have enlightened you on the first of these points in my former letter and shall now speak of the second

In one word, then, I found that their difference about sufficient grace may be defined thus The Jesuits maintain that there is a grace given generally to all men, subject in such a way to free will that the will renders it efficacious or inefficacious at its pleasure, without any additional aid from God and without wanting anything on his part in order to act effectively, and hence they term this grace *sufficient*, because it suffices of itself for action The Jansenists, on the other hand, will not allow that any grace is actually sufficient which is not also efficacious, that is, that all those kinds of grace which do not determine the will to act effectively are insufficient for action, for they hold that a man can never act without *efficacious grace*

Such are the points in debate between the Jesuits and the Jansenists, and my next object was to ascertain the doctrine of the New Thomists It is rather an odd one, he said, ' they agree with the Jesuits in admitting a *sufficient grace* given to all men, but they maintain, at the same time, that no man can act with this grace alone, but that, in order to do this, he must receive from God an efficacious grace which really determines his will to the action, and which God does not grant to all men So that, according to this doctrine, ' said I, this grace is *sufficient* without being sufficient Exactly so, he replied, for if it suffices, there is no

need of anything more for acting and if it does not suffice why—it is not sufficient

But asked I where then is the difference between them and the Jansenists? They differ in this he replied that the Dominicans have this good qualification that they do not refuse to say that all men have the *sufficient grace* I understand you returned I but they say it without thinking it for they add that in order to act we must have an *efficacious grace which is not given to all* consequently if they agree with the Jesuits in the use of a term which has no sense they differ from them and coincide with the Jansenists in the substance of the thing That is very true said he How then said I are the Jesuits united with them? and why do they not combat them as well as the Jansenists since they will always find powerful antagonists in these men who by maintaining the necessity of the efficacious grace which determines the will will prevent them from establishing that grace which they hold to be of itself sufficient?

The Dominicans are too powerful he replied and the Jesuits are too politic to come to an open rupture with them The Society is content with having prevailed on them so far as to admit the name of *sufficient grace* though they understand it in another sense by which manœuvre they gain this advantage that they will make their opinion appear untenable as soon as they judge it proper to do so And this will be no difficult matter for let it be once granted that all men have the sufficient graces nothing can be more natural than to conclude that the efficacious grace is not necessary to action—the sufficiency of the general grace precluding the necessity of all others By saying *sufficient* we express all that is necessary for action and it will serve little purpose for the Dominicans to exclaim that they attach another sense to the expression the people accustomed to the common acceptation of that term would not even listen to their explanation Thus the Society gains a sufficient advantage from the expression which has been adopted by the Dominicans without pressing them any further and were you but acquainted with what passed under Popes Clement VIII and Paul V and knew how the Society was thwarted by the Dominicans in the establishment of the sufficient grace you would not be surprised to find that it avoids embroiling itself in quarrels with them and allows them to hold their own opinion provided that of the Society is left untouched and more especially when the Dominicans countenance its doctrine by agreeing to employ on all public occasions the term *sufficient grace*

'The Society he continued is quite satisfied with their complaisance It does not insist on their denying the necessity of efficacious grace this would be urging them too far People should not tyrannize over their friends and the Jesuits have gained quite enough The world is content with words few think of searching into the nature of things and thus the name of *sufficient grace* being adopted on both sides though in different senses there is nobody except the most subtle theologians who ever dreams of doubting that the thing signified by that word is held by the Jacobins as well as by the Jesuits and the result will show that these last are not the greatest dupes

I acknowledged that they were a shrewd class of people these Jesuits and availing myself of his advice I went straight to the Jacobins at whose gate I found one of my good friends a staunch Jansenist (for you must know I have got friends among all parties) who was calling for another monk different from him whom

I was in search of I prevailed on him, however, after much entreaty, to accompany me, and asked for one of my New Thomists He was delighted to see me again How now! my dear father, " I began, "it seems it is not enough that all men have a *proximate power*, with which they can never act with effect, they must have besides this a *sufficient grace*, with which they can act as little Is not that the doctrine of your school? "It is, " said the worthy monk, " and I was upholding it this very morning in the Sorbonne I spoke on the point during my whole half-hour, and, but for the *sand glass*, I bade fair to have reversed that wicked proverb, now so current in Paris He votes without speaking, like a monk in the Sorbonne ' " "What do you mean by your *half hour* and your *sand glass*? I asked, "do they cut your speeches by a certain measure? " Yes, said he, they have done so for some days past " "And do they oblige you to speak for half an hour? " "No, we may speak as little as we please But not as much as you please," said I O what a capital regulation for the boobies! what a blessed excuse for those who have nothing worth the saying! But, to return to the point, father, this grace given to all men is *sufficient*, is it not? " "Yes," said he "And yet it has no effect without *efficacious grace*? None whatever, he replied "And all men have the sufficient, continued I, and all have not the efficacious? " Exactly, said he That is," returned I, all have enough of grace, and all have not enough of it—that is, this grace suffices, though it does not suffice—that is, it is sufficient in name and insufficient in effect! In good sooth, father, this is particularly subtle doctrine! Have you forgotten, since you retired to the cloister, the meaning attached, in the world you have quitted, to the word *sufficient*? don t you remember that it includes all that is necessary for acting? But no, you cannot have lost all recollection of it, for, to avail myself of an illustration which will come home more vividly to your feelings, let us suppose that you were supplied with no more than two ounces of bread and a glass of water daily, would you be quite pleased with your prior were he to tell you that this would be sufficient to support you, under the pretext that, along with something else, which however, he would not give you, you would have all that would be necessary to support you? How, then can you allow yourselves to say that all men have sufficient grace for acting, while you admit that there is another grace absolutely necessary to acting which all men have not? Is it because this is an unimportant article of belief, and you leave all men at liberty to believe that efficacious grace is necessary or not, as they choose? Is it a matter of indifference to say, that with sufficient grace a man may really act? How! cried the good man, indifference! it is heresy—formal heresy The necessity of *efficacious grace* for acting effectively, is a point of *faith*—it is heresy to deny it "

Where are we now? " I exclaimed, " and which side am I to take here? If I deny the sufficient grace, I am a Jansenist If I admit it, as the Jesuits do, in the way of denying that efficacious grace is necessary, I shall be a heretic, say you And if I admit it, as you do, in the way of maintaining the necessity of efficacious grace, I sin against common sense, and am a blockhead, say the Jesuits What must I do, thus reduced to the inevitable necessity of being a blockhead, a heretic, or a Jansenist? And what a sad pass are matters come to, if there are none but the Jansenists who avoid coming into collision either with the faith or with reason, and who save themselves at once from absurdity and from error!

My Jansenist friend took this speech as a good omen and already looked upon

me as a convert He said nothing to me however but addressing the monk Pray father inquired he what is the point on which you agree with the Jesuits? We agree in this he replied that the Jesuits and we acknowledge the sufficient grace given to all But said the Jansenist there are two things in this expression *sufficient grace*—there is the sound which is only so much breath and there is the thing which it signifies which is real and effectual And therefore as you are agreed with the Jesuits in regard to the word *sufficient* and opposed to them as to the sense it is apparent that you are opposed to them in regard to the substance of that term and that you only agree with them as to the sound Is this what you call acting sincerely and cordially?

But said the good man what cause have you to complain since we deceive nobody by this mode of speaking? In our schools we openly teach that we understand it in a manner different from the Jesuits

What I complain of returned my friend is that you do not proclaim it everywhere that by sufficient grace you understand the grace which is *not* sufficient You are bound in conscience by thus altering the sense of the ordinary terms of theology to tell that when you admit a sufficient grace in all men you understand that they have not sufficient grace in effect All classes of persons in the world understand the word *sufficient* in one and the same sense the New Thomists alone understand it in another sense All the women who form one half of the world all courtiers all military men all magistrates all lawyers merchants artisans the whole populace—in short all sorts of men except the Dominicans understand the word *sufficient* to express all that is necessary Scarcely any one is aware of this singular exception It is reported over the whole earth simply that the Dominicans hold that all men have the *sufficient graces* What other conclusion can be drawn from this than that they hold that all men have all the graces necessary for action especially when they are seen joined in interest and *intrigue with the Jesuits* who understand the thing in that sense? Is not the uniformity of your expressions viewed in connection with this union of party a manifest indication and confirmation of the uniformity of your sentiments?

The multitude of the faithful inquire of theologians What is the real condition of human nature since its corruption? St Augustine and his disciples reply that it has no sufficient grace until God is pleased to bestow it Next come the Jesuits and they say that all have the effectually sufficient graces The Dominicans are consulted on this contrariety of opinion and what course do they pursue? They unite with the Jesuits by this coalition they make up a majority they secede from those who deny these sufficient graces they declare that all men possess them Who on hearing this would imagine anything else than that they gave their sanction to the opinion of the Jesuits? And then they add that nevertheless these said sufficient graces are perfectly useless without the efficacious which are not given to all!

Shall I present you with a picture of the Church amidst these *conflicting sentiments*? I consider her very like a man who leaving his *native country on a journey* is encountered by *robbers* who *inflict* many wounds on him and leave him half dead He sends for three *physicians resident* in the neighboring towns The *first on probing his* wounds pronounces them mortal and assures him that none but *God* can restore to him his lost powers The second coming after the other *chooses to flatter* the man—tells him that he has still sufficient strength to reach

his home, and, abusing the first physician who opposed his advice, determines upon his ruin In this dilemma, the poor patient, observing the third medical gentleman at a distance, stretches out his hands to him as the person who should determine the controversy This practitioner, on examining his wounds, and ascertaining the opinions of the first two doctors, embraces that of the second, and uniting with him, the two combine against the first, and being the stronger party in number drive him from the field in disgrace From this proceeding, the patient naturally concludes that the last comer is of the same opinion with the second, and, on putting the question to him, he assures him most positively that his strength is sufficient for prosecuting his journey The wounded man, however, sensible of his own weakness, begs him to explain to him how he considered him sufficient for the journey Because, replies his adviser, you are *still* in possession of your legs, and legs are the organs which naturally suffice for walking But, says the patient, 'have I all the strength necessary to make use of my legs? for, in my present weak condition, it humbly appears to me that they are wholly useless Certainly you have not, replies the doctor, you will never walk *effectively*, unless God vouchsafes some extraordinary assistance to sustain and conduct you 'What! exclaims the poor man, do you not mean to say that I have sufficient strength in me, so as to want for nothing to walk effectively? Very far from it, returns the physician 'You must, then, says the patient, be of a different opinion from your companion there about my real condition I must admit that I am,' replies the other

What do you suppose the patient said to this? Why, he complained of the strange conduct and ambiguous terms of this third physician He censured him for taking part with the second, to whom he was opposed in sentiment, and with whom he had only the semblance of agreement, and for having driven away the first doctor, with whom he in reality agreed, and, after making a trial of his strength, and finding by experience his actual weakness, he sent them both about their business, recalled his first adviser, put himself under his care, and having, by his advice, implored from God the strength of which he confessed his need, obtained the mercy he sought, and, through divine help, reached his house in peace

The worthy monk was so confounded with this parable that he could not find words to reply To cheer him up a little, I said to him, in a mild tone But after all, my dear father, what made you think of giving the name of *sufficient* to a grace which you say it is a point of faith to believe is, in fact, insufficient? It is very easy for you to talk about it, said he You are an independent and private man, I am a monk and in a community—cannot you estimate the difference between the two cases? We depend on superiors, they depend on others They have promised our votes—what would you have to become of me? We understood the hint, and this brought to our recollection the case of his brother monk, who, for a similar piece of indiscretion, has been exiled to Abbeville

But,' I resumed, ' how comes it about that your community is bound to admit this grace?' That is another question, he replied All that I can tell you is, in one word, that our order has defended, to the utmost of its ability, the doctrine of St Thomas on efficacious grace With what ardor did it oppose, from the very *commencement, the doctrine* of Molina? How did it labor to establish the necessity of the efficacious grace of Jesus Christ? Don t you know what happened under Clement VIII and Paul V, and how, the former having been prevented by

death and the latter hindered by some Italian affairs from publishing his bull our arms still sleep in the Vatican? But the Jesuits availing themselves since the introduction of the heresy of Luther and Calvin of the scanty light which the people possess for discriminating between the error of these men and the truth of the doctrine of St Thomas disseminated their principles with such rapidity and success that they became ere long masters of the popular belief while we on our part found ourselves in the predicament of being denounced as Calvinists and treated as the Jansenists are at present unless we qualified the efficacious grace with at least the apparent avowal of a *sufficient* In this extremity what better course could we have taken for saving the truth without losing our own credit than by admitting the name of sufficient grace while we denied that it was such in effect? Such is the real history of the case

This was spoken in such a melancholy tone that I really began to pity the man not so however my companion Flatter not yourselves said he to the monk with having saved the truth had she not found other defenders in your feeble hands she must have perished By admitting into the Church the name of her enemy you have admitted the enemy himself Names are inseparable from things If the term *sufficient grace* be once established it will be vain for you to protest that you understand by it a grace which is *not* sufficient Your protest will be held inadmissible Your explanation would be scouted as odious in the world where men speak more ingenuously about matters of infinitely less moment The Jesuits will gain a triumph—it will be their grace which is sufficient in fact and not yours which is only so in name that will pass as established and the converse of your creed will become an article of faith

We will all suffer martyrdom first cried the father rather than consent to the establishment of *sufficient grace in the sense of the Jesuits* St Thomas whom we have sworn to follow even to the death is diametrically opposed to such doctrine

To this my friend who took up the matter more seriously than I did replied Come now father your fraternity has received an honor which it sadly abuses It abandons that grace which was confided to its care and which has never been abandoned since the creation of the world That victorious grace which was waited for by the patriarchs predicted by the prophets introduced by Jesus Christ preached by St Paul explained by St Augustine the greatest of the fathers embraced by his followers confirmed by St Bernard the last of the fathers supported by St Thomas the angel of the schools transmitted by him to your order maintained by so many of your fathers and so nobly defended by your monks under Popes Clement and Paul—that efficacious grace which had been committed as a sacred deposit into your hands that it might find in a sacred and everlasting order a succession of preachers who might proclaim it to the end of time—is discarded and deserted for interests the most contemptible It is high time for other hands to arm in its quarrel It is time for God to raise up intrepid disciples of the Doctor of grace who strangers to the entanglements of the world will serve God for God s sake Grace may not indeed number the Dominicans among her champions but champions she shall never want for by her own almighty energy she creates them for herself She demands hearts pure and disengaged nay she herself purifies and disengages them from worldly interests incompatible with the truths of the Gospel Reflect seriously on this father and

take care that God does not remove this candlestick from its place, leaving you in darkness and without the crown, as a punishment for the coldness which you manifest to a cause so important to his Church '

He might have gone on in this strain much longer, for he was kindling as he advanced, but I interrupted him by rising to take my leave and said 'Indeed, my dear father, had I any influence in France, I should have it proclaimed, by sound of trumpet 'BE IT KNOWN TO ALL MEN, *that when the Jacobins* SAY *that sufficient grace is given to all, they* MEAN *that all have not the grace which actually suffices'* After which, you might say it as often as you please, but not otherwise And thus ended our visit

You will perceive, therefore, that we have here a *politic sufficiency* somewhat similar to *proximate power* Meanwhile I may tell you that it appears to me that both the proximate power and this same sufficient grace may be safely doubted by anybody, provided he is not a Jacobin

I have just come to learn, when closing my letter, that the censure has passed But as I do not yet know in what terms it is worded, and as it will not be published till the 15th of February, I shall delay writing you about it till the next post I am, &c

REPLY OF THE "PROVINCIAL TO THE FIRST TWO LETTERS OF HIS FRIEND

February 2, 1656

SIR,

Your two letters have not been confined to me Everybody has seen them, everybody understands them, and everybody believes them They are not only in high repute among theologians—they have proved agreeable to men of the world, and intelligible even to the ladies

In a communication which I lately received from one of the gentlemen of the Academy—one of the most illustrious names in a society of men who are all illustrious—who had seen only your first letter, he writes me as follows I only wish that the Sorbonne, which owes so much to the memory of the late cardinal, would acknowledge the jurisdiction of his French Academy The author of the letter would be satisfied, for, in the capacity of an academician, I would authoritatively condemn, I would banish, I would proscribe—I had almost said exterminate—to the extent of my power, this *proximate power*, which makes so much noise about nothing and without knowing what it would have The misfortune is that our academic *power* is a very limited and *remote* power I am sorry for it, and still more sorry that my small power cannot discharge me from my obligations to you,' &c.

My next extract is from the pen of a lady, whom I shall not indicate in any way whatever She writes thus to a female friend who had transmitted to her the first of your letters You can have no idea how much I am obliged to you for the letter you sent me—it is so very ingenious, and so nicely written It narrates, and yet it is not a narrative, it clears up the most intricate and involved of all possible matters, its raillery is exquisite, it enlightens those who know little about the subject and imparts double delight to those who understand it It is an admirable apology, and, if they would so take it, a delicate and innocent censure In short, that letter

death and the latter hindered by some Italian affairs from publishing his bull our arms still sleep in the Vatican? But the Jesuits availing themselves since the introduction of the heresy of Luther and Calvin of the scanty light which the people possess for discriminating between the error of these men and the truth of the doctrine of St Thomas disseminated their principles with such rapidity and success that they became ere long masters of the popular belief while we on our part found ourselves in the predicament of being denounced as Calvinists and treated as the Jansenists are at present unless we qualified the efficacious grace with at least the apparent avowal of a *sufficient* In this extremity what better course could we have taken for saving the truth without losing our own credit than by admitting the name of sufficient grace while we denied that it was such in effect? Such is the real history of the case

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To this my friend who took up the matter more seriously than I did replied Come now father your fraternity has received an honor which it sadly abuses It abandons that grace which was confided to its care and which has never been abandoned since the creation of the world That victorious grace which was waited for by the patriarchs predicted by the prophets introduced by Jesus Christ preached by St Paul explained by St Augustine the greatest of the fathers embraced by his followers confirmed by St Bernard the last of the fathers supported by St Thomas the angel of the schools transmitted by him to your order maintained by so many of your fathers and so nobly defended by your monks under Popes Clement and Paul—that efficacious grace which had been committed as a sacred deposit into your hands that it might find in a sacred and everlasting order a succession of preachers who might proclaim it to the end of time —is discarded and deserted for interests the most contemptible It is high time for other hands to arm in its quarrel It is time for God to raise up intrepid disciples of the Doctor of grace who strangers to the entanglements of the world will serve God for God s sake Grace may not indeed number the Dominicans among her champions but champions she shall never want for by her own almighty energy she creates them for herself She demands hearts pure and disengaged nay she herself purifies and disengages them from worldly interests incompatible with the truths of the Gospel Reflect seriously on this father and

What else could any one infer from such proceedings than that this proposition, selected under such remarkable circumstances, would contain the essence of the blackest heresies imaginable And yet the proposition so entirely agrees with what is clearly and formally expressed in the passages from the fathers quoted by *M Arnauld that I have not met with a single individual* who could comprehend the difference between them Still, however, it might be imagined that there was a very great difference, for the passages from the fathers being unquestionably Catholic, the proposition of M Arnauld, if heretical, must be widely opposed to them

Such was the difficulty which the Sorbonne was expected to clear up All Christendom waited, with wide opened eyes, to discover, in the censure of these learned doctors, the point of difference which had proved imperceptible to ordinary mortals Meanwhile M Arnauld gave in his defences, placing his own proposition and the passages of the fathers from which he had drawn it in parallel columns, so as to make the agreement between them apparent to the most obtuse understandings

He shows, for example, that St Augustine says in one passage that Jesus Christ points out to us, in the person of St Peter, a righteous man warning us by his fall to avoid presumption ' He cites another passage from the same father, in which he says 'that God, in order to show us that without grace we can do nothing, left St Peter without grace He produces a third, from St Chrysostom, who says, ' that the fall of St Peter happened, not through any coldness towards Jesus Christ, but because grace failed him, and that he fell, not so much through his own negligence as through the withdrawment of God, as a lesson to the whole Church, that without God we can do nothing He then gives his own accused *proposition, which is as follows The fathers point out to us, in the person of* St Peter, a righteous man to whom that grace without which we can do nothing was wanting

In vain did people attempt to discover how it could possibly be that M Arnauld s expression differed from those of the fathers as much as the truth from error and faith from heresy For where was the difference to be found? Could it be in these words that the fathers point out to us, in the person of St Peter, a righteous man ? St Augustine has said the same thing in so many words Is it because he says that grace had failed him ? The same St Augustine who had said that St Peter was a righteous man, says that he had not had grace on that occasion ' Is it, then, for his having said that without grace we can do nothing ? Why, is not this just what St Augustine says in the same place, and what St Chrysostom had said before him, with this difference only, that he expresses it in much stronger language, as when he says *that his fall did not happen through his own coldness or negligence*, but through the failure of grace, and the withdrawment of God"?

Such considerations as these kept everybody in a state of breathless suspense to learn in what this diversity could consist, when at length, after a great many meetings, this famous and long looked for censure made its appearance But, alas! it has sadly baulked our expectation Whether it be that the Molinist doctors would not condescend so far as to enlighten us on the point, or for some other mysterious reason, the fact is they have done nothing more than pronounce these words This proposition is rash, impious, blasphemous, accursed, and heretical!

Would you believe it sir that most people finding themselves deceived in their expectations have got into bad humor and begin to fall foul upon the censors themselves? They are drawing strange inferences from their conduct in favour of M Arnauld s innocence What! they are saying is this all that could be achieved during all this time by so many doctors joining in a furious attack on one individual? Can they find nothing in all his works worthy of reprehension but three lines and these extracted word for word from the greatest doctors of the Greek and Latin Churches? Is there any author whatever whose writings were it intended to ruin him would not furnish a more specious pretext for the purpose? And what higher proof could be furnished of the orthodoxy of this illustrious accused?

How comes it to pass they add that so many denunciations are launched in this censure into which they have crowded such terms as poison pestilence horror rashness impiety blasphemy abomination execration anathema heresy —the most dreadful epithets that could be used against Arius or Antichrist himself and all to combat an imperceptible heresy and that moreover without telling us what it is? If it be against the words of the fathers that they inveigh in this style where is the faith and tradition? If against M Arnauld s proposition let them point out the difference between the two for we can see nothing but the most perfect harmony between them As soon as we have discovered the evil of the proposition we shall hold it in abhorrence but so long as we do not see it or rather see nothing in the statement but the sentiments of the holy fathers conceived and expressed in their own terms how can we possibly regard it with any other feelings than those of holy veneration?

Such is the specimen of the way in which they are giving vent to their feelings But these are by far too deep thinking people You and I who make no pretensions to such extraordinary penetration may keep ourselves quite easy about the whole affair What! would we be wiser than our masters? No let us take example from them and not undertake what they have not ventured upon We would be sure to get boggled in such an attempt Why it would be the easiest thing imaginable to render this censure itself heretical Truth we know is so delicate that if we make the slightest deviation from it we fall into error but this alleged error is so extremely finespun that if we diverge from it in the slightest degree we fall back upon the truth There is positively nothing between this obnoxious proposition and the truth but an imperceptible point The distance between them is so impalpable that I was in terror lest from pure inability to perceive it I might in my over anxiety to agree with the doctors of the Sorbonne place myself in opposition to the doctors of the Church Under this apprehension I judged it expedient to consult one of those who through policy was neutral on the first question that from him I might learn the real state of the matter I have accordingly had an interview with one of the most intelligent of that party whom I requested to point out to me the difference between the two things at the same time frankly owning to him that I could see none

He appeared to be amused at my simplicity and replied with a smile How simple it is in you to believe that there is any difference! Why where could it be? Do you imagine that if they could have found out any discrepancy between M Arnauld and the fathers they would not have boldly pointed it out and been delighted with the opportunity of exposing it before the public in whose eyes

they are so anxious to depreciate that gentleman?'

I could easily perceive, from these few words, that those who had been neutral on the first question would not all prove so on the second, but, anxious to hear his reasons, I asked 'Why, then, have they attacked this unfortunate proposition?

'Is it possible,' he replied, "you can be ignorant of these two things, which I thought had been known to the veriest tyro in these matters? that, on the one hand, M Arnauld has uniformly avoided advancing a single tenet which is not powerfully supported by the tradition of the Church, and that, on the other hand, his enemies have determined, cost what it may, to cut that ground from under him, and, accordingly, that as the writings of the former afforded no handle to the designs of the latter, they have been obliged, in order to satiate their revenge, to seize on some proposition, it mattered not what, and to condemn it without telling why or wherefore Do not you know how the Jansenists keep them in check, and annoy them so desperately that they cannot drop the slightest word against the principles of the fathers without being incontinently overwhelmed with whole volumes, under the pressure of which they are forced to succumb? So that, after a great many proofs of their weakness, they have judged it more to the purpose, and much less troublesome, to censure than to reply—it being a much easier matter with them to find monks than reasons

Why then,' said I, if this be the case, their censure is not worth a straw, for who will pay any regard to it, when they see it to be without foundation, and refuted, as it no doubt will be, by the answers given to it?

"If you knew the temper of people, replied my friend the doctor, you would talk in another sort of way Their censure, censurable as it is, will produce nearly all its designed effect for a time, and although, by the force of demonstration, it is certain that, in course of time, its invalidity will be made apparent, it is equally true that, at first, it will tell as effectually on the minds of most people as if it had been the most righteous sentence in the world Let it only be cried about the streets Here you have the censure of M Arnauld!—here you have the condemnation of the Jansenists! and the Jesuits will find their account in it How few will ever read it! How few, of them who do read, will understand it! How few will observe that it answers no objections! How few will take the matter to heart, or attempt to sift it to the bottom! Mark, then, how much advantage this gives to the enemies of the Jansenists They are sure to make a triumph of it, though a vain one, as usual, for some months at least— and that is a great matter for them— they will look out afterwards for some new means of subsistence They live from hand to mouth, sir It is in this way they have contrived to maintain themselves down to the present day Sometimes it is by a catechism in which a child is made to condemn their opponents, then it is by a procession, in which sufficient grace leads the efficacious in triumph again it is by a comedy, in which Jansenius is represented as carried off by devils, at another time it is by an almanac, and now it is by this censure

In good sooth, said I I was on the point of finding fault with the conduct of the Molinists, but after what you have told me, I must say I admire their prudence and their policy I see perfectly well that they could not have followed a safer or more judicious course '

'You are right, returned he, ' their safest policy has always been to keep silent,

and this led a certain learned divine to remark that the cleverest among them are those who intrigue much speak little and write nothing

It is on this principle that from the commencement of the meetings they prudently ordained that if M Arnauld came into the Sorbonne it must be simply to explain what he believed and not to enter the lists of controversy with any one The examiners having ventured to depart a little from this prudent arrangement suffered for their temerity They found themselves rather too vigourously refuted by his second apology

On the same principle they had recourse to that rare and very novel device of the half hour and the sand glass By this means they rid themselves of the importunity of those troublesome doctors who might undertake to refute all their arguments to produce books which might convict them of forgery to insist on a reply and reduce them to the predicament of having none to give

It is not that they were so blind as not to see that this encroachment on liberty which has induced so many doctors to withdraw from the meetings would do no good to their censure and that the protest of nullity taken on this ground by M Arnauld before it was concluded would be a bad preamble for securing it a favourable reception They know very well that unprejudiced persons place fully as much weight on the judgement of seventy doctors who had nothing to gain by defending M Arnauld as on that of a hundred others who had nothing to lose by condemning him But upon the whole they considered that it would be of vast importance to have a censure although it should be the act of a party only in the Sorbonne and not of the whole body although it should be carried with little or no freedom of debate and obtained by a great many small manœuvres not exactly according to order although it should give no explanation of the matter in dispute although it should not point out in what this heresy consists and should say as little as possible about it for fear of committing a mistake This very silence is a mystery in the eyes of the simple and the censure will reap this singular advantage from it that they may defy the most critical and subtle theologians to find in it a single weak argument

Keep yourself easy then and do not be afraid of being set down as a *heretic* though you should make use of the condemned proposition It is bad I assure you only as occurring in the second letter of M Arnauld If you will not believe this statement on my word I refer you to M le Moine the most zealous of the examiners who in the course of conversation with a doctor of my acquaintance this very morning on being asked by him where lay the point of difference *in* dispute and if one would no longer be allowed to say what the fathers had said before him made the following exquisite reply This proposition would be orthodox *in* the mouth of any other—it is only as coming from M Arnauld *that* the Sorbonne has condemned it! You must now be prepared to admire the machinery of Molinism which can produce such prodigious overturnings in the Church —*that* what is Catholic in the fathers becomes heretical in M Arnauld—that *what is heretical in* the Semi Pelagians becomes orthodox in the writings of the Jesuits the ancient doctrine of St Augustine becomes an intolerable innovation and new inventions daily fabricated before our eyes pass for the ancient faith of the Church So saying he took his leave of me

This information has satisfied my purpose I gather from it that this same heresy is one of an entirely new species It is not the sentiments of M Arnauld that are

heretical, it is only his person This is a personal heresy He is not a heretic for anything he has said or written, but simply because he is M Arnauld This is all they have to say against him Do what he may, unless he cease to be, he will never be a good Catholic The grace of St Augustine will never be the true grace, so long as he continues to defend it It would become so at once, were he to take it into his head to impugn it That would be a sure stroke, and almost the only plan for establishing the truth and demolishing Molinism, such is the fatality attending all the opinions which he embraces

Let us leave them, then, to settle their own differences These are the disputes of theologians, not of theology We, who are no doctors, have nothing to do with their quarrels Tell our friends the news of the censure, and love me while I am, &c

LETTER IV

Paris, *February* 25, 1656

SIR,

Nothing can come up to the Jesuits I have seen Jacobins, doctors, and all sorts of people in my day, but such an interview as I have just had was wanting to complete my knowledge of mankind Other men are merely copies of them As things are always found best at the fountainhead, I paid a visit to one of the ablest among them, in company with my trusty Jansenist—the same who accompanied me to the Dominicans Being particularly anxious to learn something of a dispute which they have with the Jansenists about what they call *actual grace*, I said to the worthy father that I would be much obliged to him if he would instruct me on this point—that I did not even know what the term meant and would thank him to explain it With all my heart, the Jesuit replied, for I dearly love inquisitive people Actual grace, according to our definition, is an inspiration of God, whereby He makes us to know His will and excites within us a desire to perform it

And where, said I, lies your difference with the Jansenists on this subject?

"The difference lies here, he replied, we hold that God bestows actual grace *on all men in every case of temptation,* for we maintain that unless a person have, whenever tempted, actual grace to keep him from sinning, his sin, whatever it may be, can never be imputed to him The Jansenists, on the other hand, affirm that sins, though committed without actual grace, are, nevertheless, imputed, but they are a pack of fools ' I got a glimpse of his meaning, but, to obtain from him a fuller explanation, I observed My dear father, it is that phrase *actual grace* that puzzles me, I am quite a stranger to it, and if you would have the goodness to tell me the same thing over again, without employing that term, you would infinitely oblige me

'Very good, returned the father, that is to say, you want me to substitute the definition in place of the thing defined, that makes no alteration of the sense, I have no objections We maintain it, then, as an undeniable principle, *that an action cannot be imputed as a sin, unless God bestow on us, before committing it, the knowledge of the evil that is in the action, and an inspiration inciting us to avoid it* Do you understand me now?

Astonished at such a declaration according to which no sins of surprise nor any of those committed in entire forgetfulness of God could be imputed I turned round to my friend the Jansenist and easily discovered from his looks that he was of a different way of thinking But as he did not utter a word I said to the monk I would fain wish my dear father to think that what you have now said is true and that you have good proofs for it

Proofs say you! he instantly exclaimed I shall furnish you with these very soon and the very best sort too let me alone for that

So saying he went in search of his books and I took this opportunity of asking my friend if there was any other person who talked in this manner? Is this so strange to you? he replied You may depend upon it that neither the fathers nor the popes nor councils nor Scripture nor any book of devotion employ such language but if you wish casuists and modern schoolmen he will bring you a goodly number of them on his side O! but I care not a rig about these authors if they are contrary to tradition I said You are right he replied

As he spoke the good father entered the room laden with books and presenting to me the first that came to hand Read that he said this is *The Summary of Sins* by *Father Bauny—the fifth edition too you see which shows that it is a* good book

It is a pity however whispered the Jansenist in my ear that this same book has been condemned at Rome and by the bishops of France

Look at page 906 said the father I did so and read as follows In order to sin and become culpable in the sight of God it is necessary to know that the thing we wish to do is not good or at least to doubt that it is—to fear or to judge that God takes no pleasure in the action which we contemplate but forbids it and in spite of this to commit the deed leap the fence and transgress

This is a good commencement I remarked And yet said he mark how far envy will carry some people It was on that very passage that M Hallier before he became one of our friends bantered Father Bauny by applying to him these words *Ecce qui tollit peccata mundi*— Behold the man that taketh away the sins of the world!

Certainly said I according to Father Bauny we may be said to behold a redemption of an entirely new description

Would you have a more authentic witness on the point? added he Here is the book of Father Annat It is the last that he wrote against M Arnauld Turn up to page 34 where there is a dog s ear and read the lines which I have marked with pencil—they ought to be written in letters of gold I then read these words

He that has no thought of God nor of his sins nor any apprehension (that is as he explained it any knowledge) of his obligation to exercise the acts of love to God or contrition has no actual grace for exercising those acts but it is equally true that he is guilty of no sin in omitting them and that if he is damned it will not be as a punishment for that omission And a few lines below he adds "The same thing may be said of a culpable commission

You see said the monk how he speaks of sins of *omission* and of *commission* Nothing escapes him What say you to that?

Say! I exclaimed I am delighted! What a charming train of consequences do I discover flowing from this doctrine! I can see the whole results already and

such mysteries present themselves before me! Why, I see more people, beyond all comparison, justified by this ignorance and forgetfulness of God, than by grace and the sacraments! But, my dear father, are you not inspiring me with a delusive joy? Are you sure there is nothing here like that *sufficiency which suffices not?* I am terribly afraid of the *Distinguo,* I was taken in with that once already! Are you quite in earnest?'

'How now!" cried the monk, beginning to get angry, "here is no matter for jesting I assure you there is no such thing as equivocation here

'I am not making a jest of it, said I, but that is what I really dread, from pure anxiety to find it true

"Well then,' he said, "to assure yourself still more of it, here are the writings of M le Moine, who taught the doctrine in a full meeting of the Sorbonne He learned it from us, to be sure, but he has the merit of having cleared it up most admirably O how circumstantially he goes to work! He shows that, in order to make out an action to be *a sin,* all these things must have passed through the mind Read, and weigh every word' I then read what I now give you in a translation from the original Latin '1 On the one hand, God sheds abroad on the soul some measure of love, which gives it a bias toward the thing commanded, and on the other, a rebellious concupiscence solicits it in the opposite direction 2 God inspires the soul with a knowledge of its own weakness 3 God reveals the knowledge of the physician who can heal it 4 God inspires it with a desire to be healed 5 God inspires a desire to pray and solicit his assistance

'And unless all these things occur and pass through the soul, added the monk, "the action is not properly a sin, and cannot be imputed, as M le Moine shows in the same place and in what follows Would you wish to have other authorities for this? Here they are

'All modern ones, however, whispered my Jansenist friend

"So I perceive, said I to him aside, and then, turning to the monk O my dear sir, cried I, 'what a blessing this will be to some persons of my acquaintance! I must positively introduce them to you You have never, perhaps, met with people who had fewer sins to account for all your life For, in the first place, they never think of God at all, their vices have got the better of their reason, they have never known either their weakness or the physician who can cure it, they have never thought of desiring the health of their soul, and still less of praying to God to bestow it, so that, according to M le Moine, they are still in the state of baptismal innocence They have never had a thought of loving God or of being contrite for their sins, so that, according to Father Annat, they have never committed sin through the want of charity and penitence Their life is spent in a perpetual round of all sorts of pleasures, in the course of which they have not been interrupted by the slightest remorse These excesses had led me to imagine that their perdition was inevitable, but you, father, inform me that these same excesses secure their salvation Blessings on you, my good father, for this way of justifying people! Others prescribe painful austerities for healing the soul, but you show that souls which may be thought desperately distempered are in quite good health What an excellent device for being happy both in this world and in the next! I had always supposed that the less a man thought of God, the more he sinned, but, from what I see now, if one could only succeed in bringing himself not to think *upon God at all, everything* would be pure with him in all time coming Away

with your half and half sinners who retain some sneaking affection for virtue! They will be damned every one of them these semi sinners But commend me to your arrant sinners—hardened unalloyed out and-out thorough bred sinners Hell is no place for them they have cheated the devil purely by virtue of their devotion to his service!

The good father who saw very well the connection between these consequences and his principle dexterously evaded them and maintaining his temper either from good nature or policy he merely replied To let you understand how we avoid these inconveniences you must know that while we affirm that these reprobates to whom you refer would be without sin if they had no thoughts of conversion and no desires to devote themselves to God we maintain that they all actually *have* such thoughts and desires and that God never permitted a man to sin without giving him previously a view of the evil which he contemplated and a desire either to avoid the offence or at all events to implore his aid to enable him to avoid it and none but Jansenists will assert the contrary

Strange! father returned I is this then the heresy of the Jansenists to deny that every time a man commits a sin he is troubled with a remorse of conscience in spite of which he leaps the fence and transgresses as Father Bauny has it? It is rather too good a joke to be made a heretic for that I can easily believe that a man may be damned for not having good thoughts but it never would have entered my head to imagine that any man could be subjected to that doom for *not believing that all mankind must have good thoughts*! But father I hold myself bound in conscience to disabuse you and to inform you that there are thousands of people who have no such desires— who sin without regret—who sin with delight—who make a boast of sinning And who ought to know better about these things than yourself? You cannot have failed to have confessed some of those to whom I allude for it is among persons of high rank that they are most generally to be met with But mark father the dangerous consequences of *your maxim* Do you not perceive what effect it may have on those libertines who like nothing better than to find out matter of doubt in religion? What a handle do you give them when you assure them as an article of faith that on every occasion when they commit a sin they feel an inward presentiment of the evil and a desire to avoid it? Is it not obvious that feeling convinced by their own experience of the falsity of your doctrine on this point which you say is a matter of faith they will extend the inference drawn from this to all the other points? They will argue that *since* you are not trustworthy in one article you are to be suspected in them all and thus you shut them up to conclude either that religion is false or that you must know very little about it

Here my friend the Jansenist following up my remarks said to him You would do well father if you wish to preserve your doctrine not to explain so precisely as you have done to us what you mean by *actual grace* For how could you without forfeiting all credit in the estimation of men openly declare that *nobody sins without having previously the knowledge of his weakness and of a physician or the desire of a cure and of asking it of God*? Will it be believed on your word that those who are immersed in avarice *impurity* blasphemy duelling revenge robbery and sacrilege have really a desire to embrace chastity humility and the other Christian virtues? Can it be conceived that those philosophers who boasted so loudly of the powers of nature knew its infirmity and its physician? Will you

maintain that those who held it as a settled maxim that 'it is not God that bestows virtue, and that no one ever asked it from him, would think of asking it for themselves? Who can believe that the Epicureans, who denied a divine providence, ever felt any inclination to pray to God? men who said that it would be an insult to invoke the Deity in our necessities, as if he were capable of wasting a thought on beings like us? In a word, how can it be imagined that idolaters and atheists, every time they are tempted to the commission of sin, in other words, infinitely *often during their lives, have a desire to pray to the true God*, of whom they are ignorant, that he would bestow on them virtues of which they have no conception?'

Yes," said the worthy monk, in a resolute tone, we will *affirm it* and sooner than allow that any one sins without having the consciousness that he is doing evil, and the desire of the opposite virtue, we will maintain that the whole world, reprobates and infidels included, have these inspirations and desires in every case of temptation You cannot show me, from the Scripture at least, that this is not the truth

On this remark I struck in, by exclaiming "What! father, must we have recourse to the Scripture to demonstrate a thing so clear as this? This is not a point of faith, nor even of reason It is a matter of fact we see it—we know it—we feel it"

But the Jansenist, keeping the monk to his own terms, addressed him as follows *If you are willing, father, to stand or fall by Scripture, I am ready to meet* you there, only you must promise to yield to its authority, and, since it is written that 'God has not revealed his judgements to the Heathen, but left them to wander in their own ways, you must not say that God has enlightened those whom the Sacred Writings assure us he has left in darkness and in the shadow of death' Is it not enough to show the erroneousness of your principle, to find that St Paul calls himself the chief of sinners,' for a sin which he committed ignorantly, and with zeal? *Is it not enough, to and from the Gospel, that those* who crucified Jesus Christ had need of the pardon which he asked for them, although they knew not the malice of their action, and would never have committed it, according to St Paul, if they had known it? *Is it not enough that Jesus Christ* apprises us that there will be persecutors of the Church, who, while making every effort to ruin her, will think that they are doing God service, teaching us that this sin, which in the judgement of the apostle, is the greatest of all sins, may be committed by persons who, so far from knowing that they were sinning, would think that they sinned by not committing it? In fine, it is not enough that Jesus Christ himself has taught us that there are two kinds of sinners, the one of whom sin with knowledge of their Master's will, and the other without knowledge, and that both of them will be chastised, although, indeed, in a different manner?

Sorely pressed by so many testimonies from Scripture, to which he had appealed, the worthy monk began *to give way, and, leaving the wicked to sin without inspiration*, he said You will not deny that *good men*, at least, never sin unless God give them — You are flinching, said I, interrupting him, you are flinching now, my good father, you abandon the general principle, and, finding that it will not hold good in regard to the wicked, you would compound the matter, by making it apply at least to the righteous But in this point of view the application of it is, I conceive, so circumscribed that it will hardly apply to anybody, and it is scarcely worth while to dispute the point'

My friend however who was so ready on the whole question that I am inclined to think he had studied it all that very morning replied This father is the last entrenchment to which those of your party who are willing to reason at all are sure to retreat but you are far from being safe even here The example of the saints is not a whit more in your favour Who doubts that they often fall into sins of surprise without being conscious of them? Do we not learn from the saints themselves how often concupiscence lays hidden snares for them and how generally it happens as St Augustine complains of himself in his *Confessions* that with all their discretion they give to pleasure what they mean only to give to necessity?

How usual is it to see the more zealous friends of truth betrayed by the heat of controversy into sallies of bitter passion for their personal interests while their consciences at the time bear them no other testimony than that they are acting in this manner purely for the interests of truth and they do not discover their mistake till long afterwards!

What again shall we say of those who as we learn from examples in ecclesiastical history eagerly involve themselves in affairs which are really bad because they believe them to be really good and yet this does not hinder the fathers from condemning such persons as having sinned on these occasions?

And were this not the case how could the saints have their secret faults? How could it be true that God alone knows the magnitude and the number of our offences that no one knows whether he is worthy of hatred or love and that the best of saints though unconscious of any culpability ought always as St Paul says of himself to remain in fear and trembling?

You perceive then father that this knowledge of the evil and love of the opposite virtue which you imagine to be essential to constitute sin are equally disproved by the examples of the righteous and of the wicked In the case of the wicked their passion for vice sufficiently testifies that they have no desire for virtue and in regard to the righteous the love which they bear to virtue plainly shows that they are not always conscious of those sins which as the Scripture teaches they are daily committing

So true is it indeed that the righteous often sin through ignorance that the greatest saints rarely sin otherwise For how can it be supposed that souls so pure who avoid with so much care and zeal the least things that can be displeasing to God as soon as they discover them and who yet sin many times every day could possibly have every time before they fell into sin the knowledge of their infirmity on that occasion and of their physician and the desire of their souls health and of praying to God for assistance and that in spite of these inspirations these devoted souls nevertheless transgress and commit the sin?

You must conclude then father that neither sinners nor yet saints have always that knowledge or those desires and inspirations every time they offend that is to use your own terms they have not always *actual grace* Say no longer with your modern authors that it is impossible for those to sin who do not know righteousness but rather join with St Augustine and the ancient fathers in saying that it is impossible *not* to sin when we do not know righteousness *Necesse est ut peccet a quo ignoratur justitia*

The good father though thus driven from both of his positions did not lose

courage, but after ruminating a little, Ha! he exclaimed, 'I shall convince you immediately' And again taking up Father Bauny, he pointed to the same place he had before quoted, exclaiming, Look now—see the ground on which he establishes his opinion! I was sure he would not be deficient in good proofs Read what he quotes from Aristotle, and you will see that, after so express an authority, you must either burn the books of this prince of philosophers or adopt our opinion Hear, then, the principles which support Father Bauny Aristotle states first, '*that an action cannot be imputed as blameworthy, if it be involuntary*'

I grant that,' said my friend

'This is the first time you have agreed together," said I 'Take my advice, father, and proceed no further'

That would be doing nothing," he replied, we must know what are the conditions necessary to constitute an action voluntary'

'I am much afraid, returned I, 'that you will get at loggerheads on that point"

'No fear of that, said he, this is sure ground—Aristotle is on my side Hear now, what Father Bauny says *In order that an action be voluntary, it must proceed from a man who perceives, knows, and comprehends what is good and what is evil in it* *Voluntarium est*—that is a voluntary action, as we commonly say with the philosopher (that is Aristotle, you know, said the monk, squeezing my hand), '*quod fit a principio cognoscente singula in quibus est actio*—which is done by a person knowing the particulars of the action, so that when the will is led inconsiderately, and without mature reflection, to embrace or reject, to do or omit to do anything, before the understanding has been able to see whether it would be right or wrong, such an action is neither good nor evil, because previous to this mental inquisition, view, and reflection on the good or bad qualities of the matter in question, the act by which it is done is not voluntary Are you satisfied now? said the father

It appears, returned I, that Aristotle agrees with Father Bauny, but that does not prevent me from feeling surprised at this statement What, sir! is it not enough to make an action voluntary that the man knows what he is doing, and does it just because he chooses to do it? Must we suppose, besides this, that he perceives, knows, and comprehends what is good and evil in the action? Why, on this supposition there would be hardly such a thing in nature as voluntary actions, for no one scarcely thinks about all this How many oaths in gambling, how many excesses in debauchery, how many riotous extravagances in the carnival, must, on this principle, be excluded from the list of voluntary actions, and consequently neither good nor bad, because not accompanied by those mental reflections on the good and evil qualities of the action? But is it possible, father, that Aristotle held such a sentiment? I have always understood that he was a sensible man"

I shall soon convince you of that, said the Jansenist, and requesting a sight of Aristotle s *Ethics*, he opened it at the beginning of the third book, from which Father Bauny had taken the passage quoted, and said to the monk I excuse you, my dear sir, for having believed, on the word of Father Bauny, that Aristotle held such a sentiment, but you would have changed your mind had you read him for yourself It is true that he teaches, that in order to make an action voluntary, we must know the particulars of that action—*singula in quibus est actio* But what else does he means by that, than the *particular circumstances* of the action? The examples which he adduces clearly show this to be his meaning for they are exclusively con-

fined to cases in which the persons were ignorant of some of the circumstances such as that of a person who wishing to exhibit a machine discharges a dart which wounds a bystander and that of Merope who killed her own son instead of her enemy and such like

Thus you see what is the kind of ignorance that renders actions involuntary namely that of the particular circumstances which is termed by divines as you must know *ignorance of the fact* But with respect to *ignorance of the right*—ignorance of the good or evil in an action—which is the only point in question let us see if Aristotle agrees with Father Bauny Here are the words of the philosopher All wicked men are ignorant of what they ought to do and what they ought to avoid and it is this very ignorance which makes them wicked and vicious Accordingly a man cannot be said to act involuntarily merely because he is ignorant of what it is proper for him to do in order to fulfil his duty This ignorance in the choice of good and evil does not make the action involuntary it only makes it vicious The same thing may be affirmed of the man who is ignorant generally of the rules of his duty such ignorance is worthy of blame not of excuse And consequently the ignorance which renders actions involuntary and excusable is simply that which relates to the fact and its particular circumstances In this case the person is excused and forgiven being considered as having acted contrary to his inclination

After this father will you maintain that Aristotle is of your opinion? And who can help being astonished to find that a Pagan philosopher had more enlightened views than your doctors in a matter so deeply affecting morals and the direction of conscience too as the knowledge of those conditions which render actions voluntary or involuntary and which accordingly charge or discharge them as sinful? Look for no more support then father from the prince of philosophers and no longer oppose yourselves to the prince of theologians who has thus decided the point in the first book of his *Retractations* chapter xv Those who sin through ignorance though they sin without meaning to sin commit the deed only because they *will* commit it And therefore even this sin of ignorance cannot be committed except by the will of him who commits it though by a will which incites him to the action merely and not to the sin and yet the action itself is nevertheless sinful for it is enough to constitute it such that he has done what he was bound not to do

The Jesuit seemed to be confounded more with the passage from Aristotle I thought than that from St Augustine but while he was thinking on what he could reply a messenger came to inform him that Madame la Maréchale of —— and Madame the Marchioness of —— requested his attendance So taking a hasty leave of us he said I shall speak about it to our fathers They will find an answer to it I warrant you we have got some long heads among us

We understood him perfectly well and on our being left alone I expressed to my friend my astonishment at the subversion which this doctrine threatened to the whole system of morals To this he replied that he was quite astonished at my astonishment Are you not yet aware he said that they have gone to far greater excess in morals than in any other matter? He gave me some strange illustrations of this promising me more at some future time The information which I may receive on this point will I hope furnish the topic of my next communication I am &c

LETTER V

Paris, *March* 20, 1656

SIR,

According to my promise, I now send you the first outlines of the morals taught by those good fathers the Jesuits, those men distinguished for learning and sagacity, who are all under the guidance of divine wisdom—a surer guide than all philosophy You imagine, perhaps, that I am in jest, but I am perfectly serious, or rather, they are so when they speak thus of themselves in their book entitled *The Image of the First Century* I am only copying their own words, and may now give you the rest of the eulogy They are a society of men, or rather let us call them angels, predicted by Isaiah in these words, Go, ye swift and ready angels ' The prediction is as clear as day, is it not? They have the spirit of eagles they are a flock of phœnixes (a late author having demonstrated that there are a great many of these birds), they have changed the face of Christendom! Of course, we must believe all this, since they have said it, and in one sense you will find the account amply verified by the sequel of this communication, in which I propose to treat of their maxims

Determined to obtain the best possible information, I did not trust to the representations of our friend the Jansenist, but sought an interview with some of themselves I found however, that he told me nothing but the bare truth, and I am persuaded he is an honest man Of this you may judge from the following account of these conferences

In the conversation I had with the Jansenist, he told me so many strange things about these fathers that I could with difficulty believe them, till he pointed them out to me *in their writings*, after which he left me nothing more to say in their defence than that these might be the sentiments of some individuals only, which it was not fair to impute to the whole fraternity And, indeed, I assured him that I knew some of them who were as severe as those whom he quoted to me were lax This led him to explain to me the spirit of the Society, which is not known to every one, and you will perhaps have no objections to learning something about it

You imagine, he began, 'that it would tell considerably in their favour to show that some of their fathers are as friendly to Evangelical maxims as others are opposed to them, and you would conclude from that circumstance, that these loose opinions do not belong to the whole Society That I grant you, for had such been the case, they would not have suffered persons among them holding sentiments so diametrically opposed to licentiousness But, as it is equally true that there are among them those who hold these licentious doctrines, you are bound also to conclude that the holy Spirit of the Society is not that of Christian severity, for had such been the case, they would not have suffered persons among them holding sentiments so diametrically opposed to that severity

And what, then, I asked, 'can be the design of the whole as a body? Perhaps they have no fixed principle, and every one is left to speak out at random whatever he thinks

That cannot be,' returned my friend, such an immense body could not sub-

sist in such a haphazard sort of way or without a soul to govern and regulate its movements besides it is one of their express regulations that none shall print a page without the approval of their superiors

But said I how can these same superiors give their con ent to maxims so contradictory?

That is what you have yet to learn he replied Know then that their object is not the corruption of manners— that is not their design But as little is it their sole aim to reform them—that would be bad policy Their idea is briefly this They have such a good opinion of themselves as to believe that it is useful and in some sort essentially necessary to the good of religion that their influence should extend everywhere and that they should govern all consciences And the Evan gelical or severe maxims being best fitted for managing some sorts of people they avail themselves of these when they find them favourable to their purpose But as these maxims do not suit the views of the great bulk of the people they waive them in the case of such persons in order to keep on good terms with all the world Accordingly having to deal with persons of all classes and of all dif ferent nations they find it necessary to have casuists assorted to match this diver sity

On this principle you will easily see that if they had none but the looser sort of casuists they would defeat their main design which is to embrace all for those that are truly pious are fond of a stricter discipline But as there are not many of that stamp they do not require many severe directors to guide them They have a few for the select few while whole multitudes of lax casuists are provided for the multitudes that prefer laxity

It is in virtue of this obliging and accommodating conduct as Father Petau calls it that they may be said to stretch out a helping hand to all mankind Should any person present himself before them for example fully resolved to make resti tution of some ill gotten gains do not suppose that they would dissuade him from it By no means on the contrary they would applaud and confirm him in such a holy resolution But suppose another should come who wishes to be ab solved without restitution and it will be a particularly hard case indeed if they cannot furnish him with means of evading the duty of one kind or another the lawfulness of which they will be ready to guarantee

By this policy they keep all their friends and defend themselves against all their foes for when charged with extreme laxity they have nothing more to do than produce their austere directors with some books which they have written on the severity of the Christian code of morals and simple people or those who never look below the surface of things are quite satisfied with these proofs of the falsity of the accusation

Thus are they prepared for all sorts of persons and so ready are they to suit the supply to the demand that when they happen to be in any part of the world where the doctrine of a crucified God is accounted foolishness they suppress the offence of the cross and preach only a glorious and not a suffering Jesus Christ This plan they followed in the Indies and in China where they permitted Chris tians to practise idolatry itself with the aid of the following ingenious contri vance they made their converts conceal under their clothes an image of Jesus Christ to which they taught them to transfer mentally those adorations which they rendered ostensibly to the idol of Cachinchoam and Keum fucum This

charge is brought against them by Gravina, a Dominican, and is fully established by the Spanish memorial presented to Philip IV, king of Spain, by the Cordeliers of the Philippine Islands, quoted by Thomas Hurtado, in his *Martyrdom of the Faith*, page 427 To such a length did this practice go that the Congregation *De Propaganda* were obliged expressly to forbid the Jesuits, on pain of excommunication, to permit the worship of idols on any pretext whatever, or to conceal the mystery of the cross from their catechumens, strictly enjoining them to admit none to baptism who were not thus instructed, and ordering them to expose the image of the crucifix in their churches all of which is amply detailed in the decree of that Congregation, dated the 9th of July, 1646, and signed by Cardinal Capponi

Such is the manner in which they have spread themselves over the whole earth, aided by *the doctrine of probable opinions*, which is at once the source and the basis of all this licentiousness You must get some of themselves to explain this doctrine to you They make no secret of it, any more than of what you have already learned, with this difference only, that they conceal their carnal and worldly policy under the garb of divine and Christian prudence, as if the faith, and tradition, its ally, were not always one and the same at all times and in all places, as if it were the part of the rule to bend in conformity to the subject which it was *meant to regulate, and as if souls, to be purified from their pollutions, had only* to corrupt the law of the Lord, in place of the law of the Lord, which is clean and pure, converting the soul which lieth in sin, and bringing it into conformity with its salutary lessons[1]

' Go and see some of these worthy fathers, I beseech you, and I am confident that you will soon discover, in the laxity of their moral system, the explanation of their doctrine about grace You will then see the Christian virtues exhibited in such a strange aspect, so completely stripped of the charity which is the life and soul of them, you will see so many crimes palliated and irregularities tolerated that you will no longer be surprised at their maintaining that all men have always enough of grace to lead a pious life, in the sense of which they understand piety Their morality being entirely Pagan, nature is quite competent to its observance When we maintain the necessity of efficacious grace, we assign it another sort of virtue for its object Its office is not to cure one vice by means of another, it is not merely to induce men to practise the external duties of religion it aims at a virtue higher than that propounded by Pharisees, or the greatest sages of Heathenism The law and reason are sufficient graces for these purposes But to disenthral the soul from the love of the world—to tear it from what it holds most dear—to make it die to itself—to lift it up and bind it wholly, only, and forever, to God—can be the work of none but an *all-powerful hand And it would be as absurd to* affirm that we have the full power of achieving such objects, as it would be to allege that those virtues, devoid of the love of God, which these fathers confound *with the virtues of Christianity*, are beyond our power '

Such was the strain of my friend s discourse, which was delivered with much feeling, for he takes these sad disorders very much to heart For my own part, I began to entertain a high admiration for these fathers, simply on account of the ingenuity of their policy, and, following his advice I waited on a good casuist of the Society, one of my old acquaintances, with whom I now resolved purposely to renew my former intimacy Having my instructions how to manage them, I had no great difficulty in getting him afloat Retaining his old attachment, he re-

ceived me immediately with a profusion of kindness and after talking over some indifferent matters I took occasion from the present season to learn something from him about fasting and thus slip insensibly into the main subject I told him therefore that I had difficulty in supporting the fast He exhorted me to do vio lence to my inclinations but as I continued to murmur he took pity on me and began to search out some ground for a dispensation In fact he suggested a num ber of excuses for me none of which happened to suit my case till at length he bethought himself of asking me whether I did not find it difficult to sleep without taking supper Yes my good father said I and for that reason I am obliged often to take a refreshment at mid day and supper at night

I am extremely happy he replied to have found out a way of relieving you without sin go in peace—you are under no obligation to fast However I would not have you depend on my word step this way to the library

On going thither with me he took up a book exclaiming with great rapture Here is the authority for you and by my conscience such an authority! It is *Escobar!*

Who is Escobar? I inquired

What! not know Escobar! cried the monk the member of our Society who compiled this *Moral Theology* from twenty four of our fathers and on this founds an analogy in his preface between his book and that in the Apocalypse which was sealed with seven seals and states that Jesus presents it thus sealed to the four living creatures Suarez Vasquez Molina and Valencia in presence of the four and twenty Jesuits who represent the four and twenty elders

He read me in fact the whole of that allegory which he pronounced to be admirably appropriate and which conveyed to my mind a sublime idea of the ex cellence of the work At length having sought out the passage of fasting Oh here it is! he said treatise 1 example 13 no 67 If a man cannot sleep without taking supper is he bound to fast? Answer *By no means!* Will that not satisfy you?

Not exactly replied I for I might sustain the fast by taking my refreshment in the morning and supping at night

Listen then to what follows they have provided for all that And what is to be said if the person might make a shift with a refreshment in the morning and supping at night?

That s my case exactly

Answer Still he is not obliged to fast because no person is obliged to change the order of his meals

A most excellent reason! I exclaimed

But tell me pray continued the monk do you take much wine?

No my dear father I answered I cannot endure it

I merely put the question returned he to apprise you that you might with out breaking the fast take a glass or so in the morning or whenever you felt in clined for a drop and that is always something in the way of supporting nature Here is the decision at the same place no 57 May one without breaking the fast drink wine at any hour he pleases and even in a large quantity? Yes he may and a dram of hippocrass too I had no recollection of the hippocrass said the monk I must take a note of that in my memorandum book

He must be a nice man this Escobar observed I

Oh! everybody likes him rejoined the father he has such delightful ques

tions! Only observe this one in the same place, no 38 If a man doubt whether he is twenty one years old, is he obliged to fast? No But suppose I were to be twenty one to night an hour after midnight, and to morrow were the fast, would I be obliged to fast to morrow? No, for you were at liberty to eat as much as you pleased for an hour after midnight, not being till then fully twenty one, and therefore having a right to break the fast day, you are not obliged to keep it '

' Well, that is vastly entertaining! cried I

"Oh, ' rejoined the father, *it is impossible to tear one s self away from the* book I spend whole days and nights in reading it, in fact, I do nothing else '

The worthy monk, perceiving that I was interested, was quite delighted, and went on with his quotations Now, said he, for a taste of Filiutius, one of the four and twenty Jesuits 'Is a man who has exhausted himself any way—by profligacy, for example—obliged to fast? By no means But if he has exhausted himself expressly to procure a dispensation from fasting, will he be held obliged? He will not, even though he should have had that design There now! would you have believed that?'

Indeed, good father, I do not believe it yet, said I ' What! is it no sin for a man not to fast when he has it in his power? And is it allowable to court occasions of committing sin, or rather, are we not bound to shun them? That would be easy enough, surely "

Not always so,' he replied, that is just as it may happen "

Happen, how? cried I

Oh! ' rejoined the monk, "so you think that if a person experience some inconvenience in avoiding the occasions of sin, he is still bound to do so? Not so thinks Father Bauny Absolution,' says he, is not to be refused to such as continue in the proximate occasions of sin, if they are so situated that they cannot give them up without becoming the common talk of the world, or subjecting *themselves to personal inconvenience*

I am glad to hear it, father, I remarked, and now that we are not obliged to avoid the occasions of sin, nothing more remains but to say that we may deliberately court them '

Even that is occasionally permitted," added he, "the celebrated casuist, Basil Ponce, has said so, and Father Bauny quotes his sentiment with approbation in his *Treatise on Penance*, as follows 'We may seek an occasion of sin directly and designedly—*primo et per se*—*when our own or our neighbour s spiritual or temporal* advantage induces us to do so

Truly," said I, it appears to be all a dream to me, when I hear grave divines talking in this manner! Come now, my dear father, tell me conscientiously, do *you* hold such a sentiment as that?

No, indeed, said he, I do not

You are speaking, then, against your conscience," continued I

Not at all, he replied, ' I was speaking on that point not according to my own conscience, but according to that of Ponce and Father Bauny, and them you may follow with the utmost safety, for I assure you that they are able men

What, father! because they have put down these three lines in their books, will *it therefore become allowable to court the occasions of sin?* I always thought that we were bound to take the Scripture and the tradition of the Church as our only rule, and not your causists

Goodness! cried the monk I declare you put me in mind of these Jansenists Think you that Father Bauny and Basil Ponce are not able to render their opinion *probable*?

Probable won t do for me said I I must have certainty

I can easily see replied the good father that you know nothing about our doctrine of *probable opinions* If you did you would speak in another strain Ah! my dear sir I must really give you some instructions on this point without knowing this positively you can understand nothing at all It is the foundation—the very A B C of our whole moral philosophy

Glad to see him come to the point to which I had been drawing him on I expressed my satisfaction and requested him to explain what was meant by a *probable opinion*?

That he replied our authors will answer better than I can do The generality of them and among others our four and twenty elders describe it thus An opinion is called *probable* when it is founded upon reasons of some consideration Hence it may sometimes happen that a single *very grave doctor* may render an opinion probable The reason is added For a man particularly given to study would not adhere to an opinion unless he was drawn to it by a good and sufficient reason

So it would appear I observed with a smile that a single doctor may turn consciences round about and upside down as he pleases and yet always land them in a safe position

You must not laugh at it sir returned the monk nor need you attempt to combat the doctrine The Jansenists tried this but they might have saved themselves the trouble—it is too firmly established Hear Sanchez one of the most famous of our fathers You may doubt perhaps whether the authority of a single good and learned doctor renders an opinion probable I answer that it does and this is confirmed by Angelus Sylvester Navarre Emanuel Sa &c It is proved thus A probable opinion is one that has a considerable foundation Now the authority of a learned and pious man is entitled to very great consideration because (mark the reason) if the testimony of such a man has great influence in convincing us that such and such an event occurred say at Rome for example why should it not have the same weight in the case of a question in morals?

An odd comparison this interrupted I between the concerns of the world and those of conscience!

Have a little patience rejoined the monk Sanchez answers that in the very next sentence Nor can I assent to the qualification made here by some writers namely that the authority of such a doctor though sufficient in matters of human right is not so in those of divine right It is of vast weight in both cases

Well father said I frankly I really cannot admire that rule Who can assure me considering the freedom your doctors claim to examine everything by reason that what appears safe to one may seem so to all the rest? The diversity of judgements is so great —

You don t understand it said he interrupting me no doubt they are often of different sentiments but what signifies that? Each renders his own opinion probable and safe We all know well enough that they are far from being of the same mind what is more there is hardly an instance in which they ever agree There are very few questions indeed in which you do not find the one say

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' O my dear father! cried I, quite alarmed, ' were all these people Christians?

' How! Christians! returned the casuist, did I not tell you that these are the only writers by whom we now govern Christendom?

Deeply affected as I was by this announcement, I concealed my emotion from the monk and only asked him if all these authors were Jesuits?

No," said he, but that is of little consequence, they have said a number of *good things for all that It is true the greater part of these same good things are* extracted or copied from our authors, but we do not stand on ceremony with them on that score, more especially as they are in the constant habit of quoting our authors with applause When Diana, for example, who does not belong to our Society, speaks of Vasquez, he calls him that phœnix of genius , and he declares more than once that Vasquez alone is to him worth all the rest of men put together —*instar omnium* Accordingly, our fathers often make use of this good Diana, and, if you understand our doctrine of probability, you will see that this is no small help in its way In fact, we are anxious that others besides the Jesuits would render their opinions probable, to prevent people from ascribing them all to us, for you will observe that, when any author, whoever he may be, advances a probable opinion, we are entitled, by the doctrine of probability, to adopt it if we please, and yet, if the author does not belong to our fraternity, we are not responsible for its soundness

I understand all that," said I It is easy to see that all are welcome that come your way, except the ancient fathers, you are masters of the field, and have only to walk the course But I foresee three or four serious difficulties and powerful barriers which will oppose your career

"And what are these? cried the monk, *looking quite alarmed*

' They are the Holy Scriptures, I replied, the popes, and the councils, whom you cannot gainsay, and who are all in the way of the Gospel

Is that all? he exclaimed, I declare you put me in a fright Do you imagine that we would overlook such an obvious scruple as that, or that we have not provided against it? A good idea, forsooth, to suppose that we would contradict Scripture, popes, and councils! I must convince you of your mistake, for I should be sorry you should go away with an impression that we are deficient in our respect to these authorities You have doubtless taken up this notion from some of the opinions of our fathers, which are apparently at variance with their decisions, though in reality they are not But to illustrate the harmony between them would require more leisure than we have at present, and, as I would not like you to retain a bad impression of us, if you agree to meet with me to morrow, I shall clear it all up then '

Thus ended our interview, and thus *shall end my present communication,* which has been long enough, besides, for one letter I am sure you will be satisfied with it, in the prospect of what is forthcoming I am, &c

Can you doubt it? he replied We have bound them sir to absolve their penitents who act according to probable opinions under the pain of mortal sin to secure their compliance When the penitent says Father Bauny follows a probable opinion the confessor is bound to absolve him though his opinion should differ from that of his penitent

But he does not say it would be a mortal sin not to absolve him said I

How hasty you are! rejoined the monk listen to what follows he has expressly decided that to refuse absolution to a penitent who acts according to a probable opinion is a sin which is in its nature mortal And to settle that point he cites the most illustrious of our fathers—Suarez Vasquez and Sanchez.

My dear sir said I that is a most prudent regulation I see nothing to fear now No confessor can dare to be refractory after this Indeed I was not aware that you had the power of issuing your orders on pain of damnation I thought that your skill had been confined to the taking away of sins I had no idea that it extended to the introduction of new ones But from what I now see you are omnipotent

That is not a correct way of speaking rejoined the father We do not introduce sins we only pay attention to them I have had occasion to remark two or three times during our conversation that you are no great scholastic "

Be that as it may father you have at least answered my difficulty But I have another to suggest How do you manage when the Fathers of the Church happen to differ from any of your casuists?

You really know very little of the subject he replied "The Fathers were good enough for the morality of their own times but they lived too far back for that of the present age which is no longer regulated by them but by the modern casuists On this Father Cellot following the famous Reginald remarks In questions of morals the modern casuists are to be preferred to the ancient fathers *though* those lived nearer to the times of the apostles And following out this maxim Diana thus decides Are beneficiaries bound to restore their revenue *when guilty* of mal appropriation of it? The ancients would say *yes* but the moderns say *no* let us therefore adhere to the latter opinion which relieves from the obligation of restitution

Delightful words these and most comfortable they must be to a great many people! I observed

We leave the fathers resumed the monk to those who deal with positive divinity As for us who are the directors of conscience we read very little of them and quote only the modern casuists There is Diana for instance a most voluminous writer he has prefixed to his works a list of his authorities which amount to *two hundred* and ninety six and the most ancient of them is only about eighty years old

It would appear then I remarked that all these have come into the world since the date of your Society?

Thereabouts he replied

That is to say dear father on your advent St Augustine St Chrysostom St Ambrose St Jerome and all *the rest* in so far as morals are concerned disappeared from the stage Would you be so kind as let me know the names at least of those modern authors who have succeeded *them*?

A most able and renowned class of men they are replied the monk Their names are Villalobos Conink Llamas Achokier Dealkozer Dellacruz Vera

cruz, Ugolin, Tambourin, Fernandez, Martinez, Suarez, Henriquez, Vasquez, Lopez, Gomez, Sanchez, De Vechis, De Grassis, De Grassalis, De Pitigianis, De Graphæis, Squilanti, Bizozeri, Barcola, De Bobadilla, Simanacha, Perez de Lara, Aldretta, Lorca, De Scarcia, Quaranta, Scophra, Pedrezza, Cabrezza, Bisbe, Dias, De Clavasio, Villagut, Adam à Manden, Iribarne, Binsfeld, Volfangi a Vorberg, Vosthery, Strevesdorf'

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LETTER VI

Paris April 10 1656

SIR

I mentioned at the close of my last letter that my good friend the Jesuit had promised to show me how the casuists reconcile the contrarieties between their opinions and the decisions of the popes the councils and the Scripture This promise he fulfilled at our last interview of which I shall now give you an account

One of the methods resumed the monk in which we reconcile these apparent contradictions is by the interpretation of some phrase Thus Pope Gregory XIV decided that assassins are not worthy to enjoy the benefit of sanctuary in churches and ought to be dragged out of them and yet our four and twenty elders affirm that the penalty of this bull is not incurred by all those that kill in treachery This may appear to you a contradiction but we get over this by interpreting the word *assassin* as follows Are assassins unworthy of sanctuary in churches? Yes by the bull of Gregory XIV they are But by the word *assassins* we understand those that have received money to murder one and accordingly such as kill without taking any reward for the deed but merely *to oblige their friends* do not come under the category of assassins

Take another instance It is said in the Gospel Give alms of your superfluity Several casuists however have contrived to discharge the wealthiest from the obligation of alms giving This may appear another paradox but the matter is easily put to rights by giving such an interpretation to the word *superfluity* that it will seldom or never happen that any one is troubled with such an article This feat has been accomplished by the learned Vasquez in his *Treatise on Alms* c 4 What men of the world lay up to improve their circumstances or those of their relatives cannot be termed *superfluity* and accordingly such a thing as superfluity is seldom to be found among men of the world not even excepting kings Diana too who generally founds on our fathers having quoted these words of Vasquez justly concludes that as to the question whether the rich are bound to give alms of their superfluity even though the affirmative were true it will seldom or never happen to be obligatory in practice

I see very well how that follows from the doctrine of Vasquez said I But how would you answer this objection that in working out one s salvation it would be as safe according to Vasquez to give no alms provided one can muster as much ambition as to have no superfluity as it is safe according to the Gospel to have no ambition at all in order to have some superfluity for the purpose of alms giving?

Why returned he the answer would be that both of these ways are safe according to the Gospel the one according to the Gospel in its more literal and obvious sense and the other according to the same Gospel as interpreted by Vasquez There you see the utility of interpretations When the terms are so clear however he continued as not to admit of an interpretation we have recourse to the observation of favourable circumstances A single example will illustrate this The popes have denounced excommunication on monks who lay *aside their* canonicals our casuists notwithstanding put it as a question On what occasions

may a monk lay aside his religious habits without incurring excommunication? They mention a number of cases in which they may, and among others the following 'If he has laid it aside for an infamous purpose, such as to pick pockets or to go *incognito* into haunts of profligacy, meaning shortly after to resume it It is evident the bulls have no reference to cases of that description '

I could hardly believe that and begged the father to show me the passage in the original He did so, and under the chapter headed 'Practice according to the School of the Society of Jesus —*Praxis ex Societatis Jesu Schola*—I read these very words *Si habitum dimittat ut furetur occulte, vel fornicetur* He showed me the same thing in Diana, in these terms *Ut eat incognitus ad lupanar* ' And why, father,' I asked, 'are they discharged from excommunication on such occasions? '

' Don t you understand it? he replied Only think what a scandal it would be, were a monk surprised in such a predicament with his canonicals on! And have you never heard, he continued, how they answer the first bull *contra sollicitantes* and how our four and twenty, in another chapter of the Practice according to the School of our Society, explain the bull of Pius V *contra clericos*, &c ?

I know nothing about all that, said I

Then it is a sign you have not read much of Escobar, returned the monk

' I got him only yesterday, father, said I, and I had no small difficulty, too in procuring a copy I don t know how it is, but everybody of late has been in search of him

The passage to which I referred, returned the monk, may be found in treatise 1, example 8, no 102 Consult it at your leisure when you go home

I did so that very night, but it is so shockingly bad that I dare not transcribe it

The good father then went on to say 'You now understand what use we make of favourable circumstances Sometimes, however, obstinate cases will occur, which will not admit of this mode of adjustment, so much so, indeed, that you would almost suppose they involved flat contradictions For example, three popes have decided that monks who are bound by a particular vow to a Lenten life cannot be absolved from it even though they should become bishops And yet Diana avers that notwithstanding this decision they *are* absolved

"And how does he reconcile that? said I

'By the most subtle of all the modern methods, and by the nicest possible application of probability, replied the monk You may recollect you were told the other day that the affirmative and negative of most opinions have each, according to our doctors, some probability—enough, at least, to be followed with a safe conscience Not that the *pro* and *con* are both true in the same sense—that is impossible—but only they are both probable and, therefore, safe, as a matter of course On this principle our worthy friend Diana remarks To the decision of these three popes, which is contrary to my opinion, I answer that they spoke in this way by adhering to the affirmative side—which, in fact, even in my judgement, is probable, but it does not follow from this that the negative may not have its probability too And in the same treatise, speaking of another subject on which he again differs from a pope, he says The pope, I grant, has said it as the head of the Church, but his decision does not extend beyond the sphere of the probability of his own opinion Now you perceive this is not doing any harm to the opinions of the popes, such a thing would never be tolerated at Rome, where Diana is in high repute For he does not say that what the popes have decided is

not probable but leaving their opinion within the sphere of probability he merely says that the contrary is also probable

That is very respectful said I

Yes added the monk and rather more ingenious than the reply made by Father Bauny when his books were censured at Rome for when pushed very hard on this point by M Hallier he made bold to write What has the censure of Rome to do with that of France? You now see how either by the interpretation of terms by the observation of favourable circumstances or by the aid of the double probability of *pro* and *on* we always contrive to reconcile those seeming contradictions which occasioned you so much surprise without ever touching on the decisions of Scripture councils or popes

Reverend father said I how happy the world is in having such men as you for its masters! And what blessings are these probabilities! I never knew the reason why you took such pains to establish that a single doctor *if a grave one* might render an opinion probable and that the contrary might be so too and that one may choose any side one pleases even though he does not believe it to be the right side and all with such a safe conscience that the confessor who should refuse him absolution on the faith of the casuists would be in a state of damnation But I see now that a single casuist may make new rules of morality at his discretion and dispose according to his fancy of everything pertaining to the regulation of manners

What you have now said rejoined the father would require to be modified a little Pay attention now while I explain our method and you will observe the progress of a new opinion from its birth to its maturity First the grave doctor who invented it exhibits it to the world casting it abroad like seed that it may take root In this state it is very feeble it requires time gradually to ripen This accounts for Diana who has introduced a great many of these opinions saying I advance this opinion but as it is new I give it time to come to maturity—*relinquo tempori maturandum* Thus in a few years it becomes insensibly consolidated and after a considerable time it is sanctioned by the tacit approbation of the Church according to the grand maxim of Father Bauny that if an opinion has been advanced by some casuist and has not been impugned by the Church it is a sign that she approves of it And in fact on this principle he authenticates one of his own principles in his sixth treatise p 312

Indeed father! cried I why on this principle the Church would approve of all the abuses which she tolerates and all the errors in all the books which she does not censure!

Dispute the point with Father Bauny he replied I am merely quoting his words and you begin to quarrel with *me* There is no disputing with facts sir *Well as I was saying* when time has thus matured an opinion it thenceforth becomes completely probable and safe Hence the learned Caramuel in dedicating his *Fundamental Theology* to Diana declares that this great Diana has rendered many opinions probable which were not so before—*quæ antea non erant* and that therefore in following them persons do not sin now though they would have sinned formerly—*jam non peccant licet ante peccaverint*

Truly father I observed it must be worth one s while living in the neighbourhood of your doctors Why of two individuals who do the same actions he that knows nothing about their doctrine sins while he that knows it does no sin

It seems, then, that their doctrine possesses at once an edifying and a justifying virtue! The law of God, according to St Paul, made transgressors, but this law of yours makes nearly all of us innocent I beseech you, my dear sir, let me know all about it I will not leave you till you have told me all the maxims which your casuists have established '

'Alas!' the monk exclaimed, ' our main object, no doubt, should have been to establish no other maxims than those of the Gospel in all their strictness and it is easy to see, from the Rules for the regulation of our manners, that, if we tolerate some degree of relaxation in others, it is rather out of complaisance than through design The truth is, sir, we are forced to it Men have arrived at such a pitch of corruption nowadays that, unable to make them come to us, we must e en go to them, otherwise they would cast us off altogether, and, what is worse, they would become perfect castaways It is to retain such characters as these that our casuists have taken under consideration the vices to which people of various conditions are most addicted, with the view of laying down maxims which, while they *cannot be said to violate the truth, are so gentle that he must be a very impracticable* subject indeed who is not pleased with them The grand project of our Society, for the good of religion, is never to repulse any one, let him be what he *may, and so avoid driving people to despair*

They have got maxims, therefore, for all sorts of persons, for beneficiaries, for priests, for monks, for gentlemen, for servants, for rich men, for commercial men, for people in embarrassed or indigent circumstances, for devout women, and women that are not devout, for married people, and irregular people In short, nothing has escaped their foresight

In other words,' said I, they have got maxims for the clergy, the nobility, and the commons Well, I am quite impatient to hear them

Let us commence, resumed the father, with the beneficiaries You are aware of the traffic with benefices that is now carried on, and that, were the matter referred to St Thomas and the ancients who had written on it, there might chance to be some simoniacs in the Church This rendered it highly necessary for our fathers to exercise their prudence in finding out a palliative With what success they have done so will appear from the following words of Valencia, who is one of Escobar s four living creatures At the end of a long discourse, in which he suggests various expedients, he propounds the following at page 2039, vol iii, which, to my mind, is the best If a person gives a temporal *in exchange for a spiritual* good —that is, if he gives money for a benefice— and gives the money as the price of the benefice, it is manifest simony But if he gives it merely as the motive which *inclines the will of the patron to confer on him the living, it is not simony*, even though the person who confers it considers and expects the money as the principal object ' Tanner, who is also a member of our Society, affirms the same thing, vol iii, p 1519, although he grants that St Thomas is opposed to it, for he expressly teaches that it is always simony to give a spiritual for a temporal good, if the temporal is the end in view By this means we prevent an immense number of simoniacal transactions, for who would be so desperately wicked as to refuse, when giving money for a benefice, to take the simple precaution of so directing his intentions as to give it as *a motive* to induce the beneficiary to part with it, instead of giving it as *the price* of the benefice? No man, surely, can be so far left to himself as that would come to

I agree with you there I replied all men I should think have *sufficient grace* to make a bargain of that sort

There can be no doubt of it returned the monk Such then is the way in which we soften matters in regard to the beneficiaries And now for the priests—we have maxims pretty favourable to them also Take the following for example from our four and twenty elders Can a priest who has received money to say a mass take an additional sum upon the same mass? Yes says Filiutius he may by applying that part of the sacrifice which belongs to himself as a priest to the person who paid him last provided he does not take a sum equivalent to a whole mass but only a part such as the third of a mass

Surely father said I this must be one of those cases in which the *pro* and the *con* have both their share of probability What you have now stated cannot fail of course to be probable having the authority of such men as Filiutius and Escobar and yet leaving that within the sphere of probability it strikes me that the contrary opinion might be made out to be probable too and might be supported by such reasons as the following That while the Church allows priests who are in poor circumstances to take money for their masses seeing it is but right that those who serve at the altar should live by the altar she never intended that they should barter the sacrifice for money and still less that they should deprive themselves of those benefits which they ought themselves in the first place to draw from it to which I might add that according to St Paul the priests are to offer sacrifice first for themselves and then for the people and that accordingly while permitted to participate with others in the benefit of the sacrifice they are not at liberty to forego their share by transferring it to another for a third of a mass or in other words for the matter of fourpence or fivepence Verily father little as I pretend to be a *grave* man I might contrive to make this opinion probable

It would cost you no great pains to do that replied the monk it is visibly probable already The difficulty lies in discovering probability in the converse of opinions manifestly good and this is a feat which none but great men can achieve Father Bauny shines in this department It is really delightful to see that learned casuist examining with characteristic ingenuity and subtlety the negative and affirmative of the same question and proving both of them to be right! Thus in the matter of priests he says in one place No law can be made to oblige the curates to say mass every day for such a law would unquestionably (*haud dubie*) expose them to the danger of saying it sometimes in mortal sin And yet in another part of the same treatise he says that priests who have received money for saying mass every day ought to say it every day and that they cannot excuse themselves on the ground that they are not always in a fit state for the service because it is in their power at all times to do penance and if they neglect this they have themselves to blame for it and not the person who made them say mass And to relieve their minds from all scruples on the subject he thus resolves the question May a priest say mass on the same day in which he has committed a mortal sin of the worst kind in the way of confessing himself beforehand? Villalobos says no because of his impurity but Sancius says He may without any sin and I hold his opinion to be safe and one which may be followed in practice—*et tuta et sequenda in praxi*

Follow this opinion in practice! cried I Will any priest who has fallen into

such irregularities have the assurance on the same day to approach the altar, on the mere word of Father Bauny? Is he not bound to submit to the ancient laws of the Church, which debarred from the sacrifice forever, or at least for a long time, priests who had committed sins of that description—instead of following the modern opinions of casuists, who would admit him to it on the very day that witnessed his fall?

You have a very short memory," returned the monk ' Did I not inform you a little ago that, according to our fathers Cellot and Reginald, in matters of morality *we are to follow, not the ancient fathers, but the modern casuists?*

I remember it perfectly, ' said I, but we have something more here we have the laws of the Church "

True," he replied, "but this shows you do not know another capital maxim of our fathers, 'that the laws of the Church lose their authority when they have gone into desuetude—*cum jam desuetudine abierunt*—as Filiutius says We know the present exigencies of the Church much better than the ancients could do Were we to be so strict in excluding priests from the altar, you can understand there would not be such a great number of masses Now a multitude of masses brings such a revenue of glory to God and of good to souls that I may venture to say, with Father Cellot, that there would not be too many priests, though not only all men and women, were that possible, but even inanimate bodies, and even brute beasts—*bruta animalia*—were transformed into priests to celebrate mass "

I was so astounded at the extravagance of this imagination that I could not utter a word and allowed him to go on with his discourse ' Enough, however, about priests, I am afraid of getting tedious let us come to the *monks* The grand difficulty with them is the obedience they owe to their superiors, now observe the palliative which our fathers apply in this case Castro Palao of our Society has said Beyond all dispute, a monk who has a probable opinion of his own, is not bound to obey his superior, though the opinion of the latter is the more probable For the monk is at liberty to adopt the opinion which is more agreeable to himself—*quæ sibi gratior fuerit*—as Sanchez says And though the order of his superior be just, that does not oblige you to obey him, for it is not just at all points or in every respect—*non undequaque juste præcepit*—but only probably so, and, consequently, you are only probably bound to obey him, and probably not bound—*probabiliter obligatus, et probabiliter deobligatus*

Certainly, father," said I, it is impossible too highly to estimate this precious fruit of the double probability

It is of great use indeed, ' he replied, 'but we must be brief Let me only give you the following specimen of our famous Molina in favour of monks who are expelled from their convents for irregularities Escobar quotes him thus Molina asserts that a monk expelled from his monastery is not obliged to reform in order to get back again, and that he is no longer bound by his vow of obedience

Well, father, cried I, this is all very comfortable for the clergy Your casuists, I perceive, have been very indulgent to them, and no wonder—they were legislating, so to speak, for themselves I am afraid people of other conditions are not so liberally treated Every one for himself in this world '

There you do us wrong, returned the monk, they could not have been kinder to themselves than we have been to them We treat all, from the highest to the lowest, with an even handed charity, sir And to prove this you tempt me to

tell you our maxims for servants In reference to this class we have taken into consideration the difficulty they must experience when they are men of conscience in serving profligate masters For if they refuse to perform all the errands in which they are employed they lose their places and if they yield obedience they have their scruples To relieve them from these our four and twenty fathers have specified the services which they may render with a safe conscience such as carrying letters and presents opening doors and windows helping their master to reach the window holding the ladder which he is mounting All this say they is allowable and indifferent it is true that as to holding the ladder they must be threatened more than usually with being punished for refusing for it is doing an injury to the master of a house to enter it by the window You perceive the judiciousness of that observation of course?

I expected nothing less said I from a book edited by four and twenty Jesuits

But added the monk Father Bauny has gone beyond this he has taught valets how to perform these sorts of offices for their masters quite innocently by making them direct their intention not to the sins to which they are accessary but to the gain which is to accrue from them In his *Summary of Sins* p 710 first edition he thus states the matter Let confessors observe says he that they cannot absolve valets who perform base errands if they consent to the sins of their masters but the reverse holds true if they have done the thing merely from a regard to their temporal emolument And that I should conceive is no difficult matter to do for why should they insist on consenting to sins of which they taste nothing but the trouble? The same Father Bauny has established a *prime maxim* in favour of those who are not content with their wages May servants who are dissatisfied with their wages use means to raise them by laying their hands on as much of the property of their masters as they may consider necessary to make the said wages equivalent to their trouble? They may in certain circumstances as when they are so poor that in looking for a situation they have been obliged to accept the offer made to them and when other servants of the same class are gaining more than they elsewhere

Ha father! cried I that is John d Alba s passage I declare

What John d Alba? inquired the father what do you mean?

Strange father! returned I do you not remember what happened in this city in the year 1647? Where in the world were you living at that time?

I was teaching cases of conscience in one of our colleges far from Paris he replied

I see you don t know the story father I must tell it to you I heard it related the other day by a man of honour whom I met in company He told us that this John d Alba who was in the service of your fathers in the College of Clermont in the Rue St Jacques being dissatisfied with his wages had purloined something to make himself amends and that your fathers on discovering the theft had thrown him into prison on the charge of larceny The case was reported to the court if I recollect right on the 16th of April 1647 for he was very minute in his statements and indeed they would hardly have been credible otherwise The poor fellow on being questioned confessed to having taken some pewter plates but maintained that for all that he had not *stolen* them pleading in his defence this very doctrine of Father Bauny which he produced before the judge along with a

pamphlet by one of your fathers, under whom he had studied cases of conscience, and who had taught him the same thing Whereupon M de Montrouge, one of the most respected members of the court, said, in giving his opinion, that he did not see how, on the ground of the writings of these fathers—writings containing a doctrine so illegal, pernicious, and contrary to all laws, natural, divine, and human, and calculated to ruin all families, and sanction all sorts of household robbery—they could discharge the accused But his opinion was that this too faithful disciple should be whipped before the college gate, by the hand of the common hangman, and that, at the same time, this functionary should burn the writings of these fathers which treated of larceny, with certification that they were prohibited from teaching such doctrine in future, upon pain of death

The result of this judgement, which was heartily approved of, was waited for with much curiosity, when some incident occurred which made them delay procedure But in the meantime the prisoner disappeared, nobody knew how, and nothing more was heard about the affair, so that John d Alba got off, pewter plates and all Such was the account he gave us, to which he added, that the judgement of M de Montrouge was entered on the records of the court, where any one may consult it We were highly amused at the story

What are you trifling about now?' cried the monk ' What does all that signify? I was explaining the maxims of our casuists, and was just going to speak of those relating to gentlemen, when you interrupt me with impertinent stories

It was only something put in by the way, father, I observed, ' and besides, I was anxious to apprise you of an important circumstance, which I find you have overlooked in establishing your doctrine of probability '

Ay, indeed!' exclaimed the monk, what defect can this be that has escaped the notice of so many ingenious men?

' You have certainly, continued I, 'contrived to place your disciples in perfect safety so far as God and the conscience are concerned, for they are quite safe in that quarter, according to you, by following in the wake of a grave doctor You have also secured them on the part of the confessors, by obliging priests, on the pain of mortal sin, to absolve all who follow a probable opinion But you have neglected to secure them on the part of the judges, so that, in following your probabilities, they are in danger of coming into contact with the whip and the gallows This is a sad oversight

You are right, ' said the monk, I am glad you mentioned it But the reason is we have no such power over magistrates as over the confessors, who are obliged to refer to us in cases of conscience, in which we are the sovereign judges

So I understand,' returned I, but if, on the one hand, you are the judges of the confessors, are you not, on the other hand, the confessors of the judges? Your power is very extensive Oblige them, on pain of being debarred from the sacraments, to acquit all criminals who act on a probable opinion, otherwise it may happen, to the great contempt and scandal of probability, that those whom you render innocent in theory may be whipped or hanged in practice Without something of this kind, how can you expect to get disciples?

The matter deserves consideration, said he, it will never do to neglect it I shall suggest it to our father Provincial You might, however have reserved this advice to some other time, without interrupting the account I was about to give you of the maxims which we have established in favour of gentlemen, and I shall

not give you any more information except on condition that you do not tell me any more stories

This is all you shall have from me at present for it would require more than the limits of one letter to acquaint you with all that I learned in a single conversation Meanwhile I am &c

LETTER VII

Paris *April* 25 1656

SIR

Having succeeded in pacifying the good father who had been rather disconcerted by the story of John d Alba he resumed the conversation on my assuring him that I would avoid all such interruptions in future and spoke of the maxims of his casuists with regard to gentlemen nearly in the following terms

You know he said that the ruling passion of persons in that rank of life is the point of honor which is perpetually driving them into acts of violence apparently quite at variance with Christian piety so that in fact they would be almost all of them excluded from our confessionals had not our fathers relaxed a little from the strictness of religion to accommodate themselves to the weakness of humanity Anxious to keep on good terms both with the Gospel by doing their duty to God and with the men of the world by showing charity to their neighbour they needed all the wisdom they possessed to devise expedients for so nicely adjusting matters as to permit these gentlemen to adopt the methods usually resorted to for vindicating their honour without wounding their consciences and thus reconcile two things apparently so opposite to each other as piety and the point of honour But sir in proportion to the utility of the design was the difficulty of the execution You cannot fail I should think to realize the magnitude and arduousness of such an enterprise?

It astonishes me certainly said I rather coldly

It astonishes you forsooth! cried the monk I can well believe that many besides you might be astonished at it Why don t you know that on the one hand the Gospel commands us not to render evil for evil but to leave vengeance to God and that on the other hand the laws of the world forbid our enduring an affront without demanding satisfaction from the offender and that *often at* the expense of his life? You have never I am sure met with anything to all appearance more diametrically opposed than these two codes of morals and yet when told that our fathers have reconciled them you have nothing more to say than simply that this astonishes you!

I did not sufficiently explain myself father I should certainly have considered the thing perfectly impracticable if I had not known from what I have seen of your fathers that they are capable of doing with ease what is impossible to other men This led me to anticipate that they must have discovered some method for meeting the difficulty—a method which I admire even before knowing it and which I pray you to explain to me

Since that is your view of the *matter* replied the monk I cannot refuse you Know then that this marvellous principle is our grand method of *directing the in*

tention—the importance of which, in our moral system, is such that I might almost venture to compare it with the doctrine of probability You have had some glimpses of it in passing, from certain maxims which I mentioned to you For example, when I was showing you how servants might execute certain troublesome jobs with a safe conscience, did you not remark that it was simply by diverting their intention from the evil to which they were accessary to the profit which they might reap from the transaction? Now that is what we call *directing the intention* You saw, too, that, were it not for a similar divergence of the mind, those who give money for benefices might be downright simoniacs But I will now show you this grand method in all its glory, as it applies to the subject of homicide—a crime which it justifies in a thousand instances, in order that, from this startling result, you may form an idea of all that it is calculated to effect '

I foresee already, said I, that, according to this mode, everything will be permitted, it will stick at nothing '

You always fly from the one extreme to the other, replied the monk prithee avoid that habit For, just to show you that we are far from permitting everything, let me tell you that we never suffer such a thing as a formal intention to sin, with the sole design of sinning, and if any person whatever should persist in having no other end but evil in the evil that he does, we break with him at once such conduct is diabolical This holds true, without exception of age, sex, or rank But when the person is not of such a wretched disposition as this, we try to put in practice our method of *directing the intention,* which simply consists in his proposing to himself, as the end of his actions, some allowable object Not that we do not endeavour, as far as we can, to dissuade men from doing things forbidden, but when we cannot prevent the action, we at least purify the motive, and thus correct the viciousness of the means by the goodness of the end Such is the way in which our fathers have contrived to permit those acts of violence to which men usually resort in vindication of their honour They have no more to do than to turn off their intention from the desire of vengeance, which is criminal, and direct it to a desire to defend their honour, which, according to us, is quite warrantable And in this way our doctors discharge all their duty towards God and towards man By permitting the action, they gratify the world, and by purifying the intention, they give satisfaction to the Gospel This is a secret, sir, which was entirely unknown to the ancients, the world is indebted for the discovery entirely to *our doctors You understand it now, I hope?*

Perfectly well, was my reply To men you grant the outward material effect of the action, and to God you give the inward and spiritual movement of the intention, and by this equitable partition, you form an alliance between the laws of God and the laws of men But, my dear sir, to be frank with you, I can hardly trust your premisses, and I suspect that your authors will tell another tale

You do me injustice, rejoined the monk, I advance nothing but what I am ready to prove, and that by such a rich array of passages that altogether their number, their authority, and their reasonings, will fill you with admiration To show you, for example, the alliance which our fathers have formed between the maxims of the Gospel and those of the world, by thus regulating the intention let me refer you to Reginald 'Private persons are forbidden to avenge themselves, for St Paul says to the Romans (12), ' Recompense to no man evil for evil , and Ecclesiasticus says (28), He that taketh vengeance shall draw on himself the venge-

ance of God and his sins will not be forgotten Besides all that is said in the Gospel about forgiving offences as in chapters 6 and 18 of S Matthew

Well father if after that he says anything contrary to the Scripture it will not be from lack of scriptural knowledge at any rate Pray how does he conclude?

You shall hear he said From all this it appears that a military man may demand satisfaction on the spot from the person who has injured him—not indeed with the intention of rendering evil for evil but with that of preserving his honour—*non ut malum pro malo reddat sed ut conservet honorem* See you how carefully they guard against the intention of rendering evil for evil because the Scripture condemns it? This is what they will tolerate on no account Thus Lessius observes that if a man has received a blow on the face he must on no account have an intention to avenge himself but he may lawfully have an intention to avert infamy and may with that view repel the insult immediately even at the point of the sword—*etiam cum gladio*" So far are we from permitting any one to cherish the design of taking vengeance on his enemies that our fathers will not allow any even to *wish their death*—by a movement of hatred If your enemy is disposed to injure you says Escobar you have no right to wish his death by a movement of hatred though you may with a view to save yourself from harm So legitimate indeed is this wish with such an intention that our great Hurtado de Mendoza says that we may *pray God* to visit with speedy death those who are bent on persecuting us if there is no other way of escaping from it

May it please your reverence said I the Church has forgotten to insert a petition to that effect among her prayers

They have not put in everything into the prayers that one may lawfully ask of God answered the monk Besides in the present case the thing was impossible for this same opinion is of more recent standing than the Breviary You are not a good chronologist friend But not to wander from the point let me request your attention to the following passage cited by Diana from Gaspar Hurtado one of Escobar s four and twenty fathers An incumbent may without any mortal sin desire the decease of a life renter on his benefice and a son that of his father and rejoice when it happens provided always it is for the sake of the profit that is to accrue from the event and not from personal aversion

Good! cried I That is certainly a very happy hit and I can easily see that the doctrine admits of a wide application But yet there are certain cases the solution of which though of great importance for gentlemen might present still greater difficulties

Propose them if you please that we may see said the monk.

Show me with all your directing of the intention returned I that it is allowable to fight a duel

Our great Hurtado de Mendoza said the father will satisfy you on that point in a twinkling If a gentleman says he in a passage cited by Diana who is challenged to fight a duel is well known to have no religion and if the vices to which he is openly and unscrupulously addicted are such as would lead people to conclude in the event of his refusing to fight that he is actua ed not by the fear of God but b dice and induce them to say of him that he was a *hen* and not a man *gallir* *ir* in that may to save his honour appear at the appoin ed s ndeed express intention of fighting a duel but merely wi efendin should the person who challenged him

come there unjustly to attack him His action in this case, viewed by itself, will be perfectly indifferent, for what moral evil is there in one stepping into a field, taking a stroll in expectation of meeting a person, and defending one s self in the event of being attacked? And thus the gentleman is guilty of no sin whatever, for in fact it cannot be called *accepting a challenge* at all, his intention being directed to other circumstances, and the acceptance of a challenge consisting in an express intention to fight, which we are supposing the gentleman never had '"

"You have not kept your word with me, sir, said I 'This is not, properly speaking, to permit duelling, on the contrary, the casuist is so persuaded that this practice is forbidden that, in licensing the action in question, he carefully avoids *calling it a duel* '

Ah! cried the monk, you begin to get knowing on my hand, I am glad to see I might reply that the author I have quoted grants all that duellists are dis posed to ask But since you must have a categorical answer, I shall allow our Father Layman to give it for me He permits duelling in so many words, provided that, in accepting the challenge, the person directs his intention solely to the preservation of his honour or his property If a soldier or a courtier is in such a predicament that he must lose either his honour or his fortune unless he accepts a challenge, I see nothing to hinder him from doing so in self defence The same thing is said by Peter Hurtado, as quoted by our famous Escobar, his words are 'One may fight a duel even to defend one s property, should that be necessary, because every man has a right to defend his property, though at the expense of his enemy's life!'"

I was struck, on hearing these passages, *with the reflection that, while the piety* of the king appears in his exerting all his power to prohibit and abolish the practice of duelling in the State, the piety of the Jesuits is shown in their employing all *their ingenuity to tolerate and sanction it in the Church But the good father was* in such an excellent key for talking that it would have been cruel to have interrupted him, so he went on with his discourse

In short,' said he, "Sanchez (mark, now, what great names I am quoting to you!) Sanchez, sir, goes a step further, for he shows how, simply by managing the intention rightly, a person may not only receive a challenge, but give one And our Escobar follows him '

' Prove that, father, *said I, and I shall give up the point* but I will not believe that he has written it, unless I see it in print

Read it yourself, then, he replied and, to be sure, I read the following extract from the *Moral Theology* of Sanchez ' It is perfectly reasonable to hold that a man may fight a duel to save his life, his honour, or any considerable portion of his property, when it is apparent *that there is a design to deprive* him of these unjustly, by law-suits and chicanery, and when there is no other way of preserving them Navarre justly observes that, in such cases, it is lawful either to accept or to send a challenge—*licet acceptare et offerre duellum* The same author adds that there is nothing to prevent one from despatching one s adversary in a private way In deed, in the circumstances *referred to*, it is advisable to avoid employing the method of the duel, if it is possible to settle the affair by privately killing our ene my, for, by this means, we escape at once from exposing our life in the combat, and from participating in the sin which our opponent would have committed by fighting the duel!

A most pious assassination! said I Still however pious though it be it is assassination if a man is permitted to kill his enemy in a treacherous manner

Did I say that he might kill him treacherously? cried the monk God forbid! I said he might kill him *privately* and you conclude that he may kill him *treacherously* as if that were the same thing! Attend sir to Escobar s definition before allowing yourself to speak again on this subject We call it *killing in treachery* when the person who is slain had no reason to suspect such a fate He therefore that slays his *enemy* cannot be said to kill him in treachery even although the blow should be given insidiously and behind his back—*licet per insidias aut a tergo percutiat* And again He that kills his enemy with whom he was reconciled under a promise of never again attempting his life cannot be *absolutely* said to kill in treachery unless there was between them all the stricter friendship—*arctior amicitia* You see now you do not even understand what the terms signify and yet you pretend to talk like a doctor

I grant you this is something quite new to me I replied and I should gather from that definition that few if any were ever killed in treachery for people seldom take it into their heads to assassinate any but their enemies Be this as it may however it seems that according to Sanchez a man may freely slay (I do not say *treacherously* but only insidiously and behind his back) a calumniator for example who prosecutes us at law?

Certainly he may returned the monk always however in the way of giving a right direction to the intention you constantly forget the main point Molina supports the same doctrine and what is more our learned brother Reginald maintains that we may despatch the false witnesses whom he summons against us And to crown the whole according to our great and famous fathers Tanner and Emanuel Sa it is lawful to kill both the false witnesses and *the judge himself* if he has had any collusion with them Here are Tanner s very words Sotus and Lessius think that it is not lawful to kill the false witnesses and the magistrate who conspire together to put an innocent person to death but Emanuel Sa and other authors with good reason impugn that sentiment at least so far as the conscience is concerned And he goes on to show that it is quite lawful to kill both the witnesses and the judge

Well father said I I think I now understand pretty well your principle regarding the direction of the intention but I should like to know something of its consequences and all the cases in which this method of yours arms a man with the power of life and death Let us go over them again for fear of mistake for equivocation here might be attended with dangerous results Killing is a matter which requires to be well timed and to be backed with a good probable opinion You have assured me then that by giving a proper turn to the intention it is lawful according to your fathers for the preservation of one s honour or even property to accept a challenge to a duel to give one sometimes to kill in a private way a false accuser and his witnesses along with him and even the judge who has been bribed to favour them and you have also told me that he who has got a blow may without avenging himself retaliate with the sword But you have not told me father to what length he may go

He can hardly mistake there replied the father for he may go all the length of killing his man This is satisfactorily proved by the learned Henriquez and others of our fathers quoted by Escobar as follows It is perfectly right to kill a

person who has given us a box on the ear, although he should run away, provided it is not done through hatred or revenge, and there is no danger of giving occasion thereby to murders of a gross kind and hurtful to society And the reason is that it is as lawful to pursue the thief that has stolen our honour, as him that has run away with our property For, although your honour cannot be said to be in the hands of your enemy in the same sense as your goods and chattels are in the hands of the thief, still it may be recovered in the same way—by showing proofs of greatness and authority, and thus acquiring the esteem of men And, in point of fact, is it not certain that *the man who has received a buffet on the ear* is held to be under disgrace, until he has wiped off the insult with the blood of his enemy?

I was so shocked on hearing this that it was with great difficulty I could contain myself, but, in my anxiety to hear the rest, I allowed him to proceed

'Nay,' he continued, it is allowable to prevent a buffet, by killing him that meant to give it, *if there be no other way to escape the insult* This opinion is quite common with our fathers For example, Azor, one of the four and twenty elders, proposing the question, Is it lawful for a *man of honour to kill another* who threatens to give him a slap on the face, or strike him with a stick? replies, 'Some say he may not, alleging that the life of our neighbour is more precious than our honour, and that it would be an act of cruelty to kill a man merely to avoid a blow Others, however, think that it is allowable, and I certainly consider it probable, when there is no other way of warding off the insult, for, otherwise, the honour of the innocent would be constantly exposed to the malice of the insolent The same opinion is given by our great Filiutius, by Father Hereau, in his *Treatise on Homicide,* by Hurtado de Mendoza, in his *Disputations,* by Becan, in his *Summary,* by our Fathers Flahaut and Lecourt, in those writings which the University, in their third petition, quoted at length, in order to bring them into disgrace (though in this they failed), and by Escobar In short, this opinion is so general that Lessius lays it down as a point which no casuist has contested, he quotes a great many that uphold, and none that deny it, and particularly Peter Navarre, who, speaking of affronts in general (and there is none more provoking than a box on the ear), declares that by the universal consent of the casuists, it is lawful to kill the calumniator, if there be no other way of averting the affront—*ex sententia omnium, licet contumeliosum occidere, si aliter ea injuria arceri nequit* Do you wish any more authorities? asked the monk

I declared I was much obliged to him, I had heard rather more than enough of them already But, just to see how far this damnable doctrine would go, I said, But, father, may not one be allowed to kill for something still less? Might not a person so direct his intention as lawfully to kill another for telling a lie, for example?'

'He may,' returned the monk, and according to Father Baldelle, quoted by Escobar, you may lawfully take the life of another for saying, You have told a lie , if there is no other way of shutting his mouth The same thing may be done in the case of slanders Our Fathers Lessius and Hereau agree in the following sentiments If you attempt to ruin my character by telling stories against me in the presence of men of honour, and I have no other way of preventing this than by putting you to death, may I be permitted to do so? According to the modern authors, I may, and that even though I have been really guilty of the crime which you divulge, provided it is a secret one, which you could not establish by legal evi-

dence And I prove it thus If you mean to rob me of my honour by giving me a box on the ear I may prevent it by force of arms and the same mode of defence is lawful when you would do me the same injury with the tongue Besides we may lawfully obviate affronts and therefore slanders In fine honour is dearer than life and as it is lawful to kill in defence of life it must be so to kill in defence of honour There you see are arguments in due form this is demonstration sir—not mere discussion And to conclude this great man Lessius shows in the same place that it is lawful to kill even for a simple gesture or a sign of contempt A man s honour he remarks may be attacked or filched away in various ways—in all of which vindication appears very reasonable as for instance when one offers to strike us with a stick or give us a slap on the face or affront us either by words or signs—*sive per signa*

Well father said I it must be owned that you have made every possible provision to secure the safety of reputation but it strikes me that human life is greatly in danger if any one may be conscientiously put to death simply for a defamatory speech or a saucy gesture

That is true he replied but as our fathers are very circumspect they have thought it proper to forbid putting this doctrine into practice on such trifling occasions They say at least that it ought *hardly* to be reduced to practice—*practice vix probari potest* And they have a good reason for that as you shall see

Oh I know what it will be interrupted I because the law of God forbids us to kill of course

They do not exactly take that ground said the father as a matter of conscience and viewing the thing abstractly they hold it allowable

And why then do they forbid it?

I shall tell you that sir It is because were we to kill all the defamers among us we should very shortly depopulate the country Although says Reginald the opinion that we may kill a man for calumny is not without its probability in theory the contrary one ought to be followed in practice for in our mode of defending ourselves we should always avoid doing injury to the commonwealth and it is evident that by killing people in this way there would be too many murders We should be on our guard says Lessius lest the practice of this maxim prove hurtful to the State for in this case it ought not to be permitted—*tunc enim non est permittendus*

What father! is it forbidden only as a point of policy and not of religion? Few people I am afraid will pay any regard to such a prohibition particularly when in a passion Very probably they might think they were doing no harm to the State by ridding it of an unworthy member

And accordingly replied the monk our Filiutius has fortified that argument with another which is of no slender importance namely that for killing people after this manner one might be punished in a court of justice

There now father I told you before that you will never be able to do any thing worth the while unless you get the magistrates to go along with you

The magistrates said the father as they do not penetrate into the conscience judge merely of the outside of the action while we look principally to the intention and hence it occasionally happens that our maxims are a little different from theirs

Be that as it may father from yours at least one thing may be fairly inferred—

that, by taking care not to injure the commonwealth, we may kill defamers with a safe conscience, provided we can do it with a sound skin But, sir, after having seen so well to the protection of honour, have you done nothing for property? I am aware it is of inferior importance, but that does not signify, I should think one might direct one s intention to kill for its preservation also "

Yes,' replied the monk, and I gave you a hint to that effect already, which may have suggested the idea to you All our casuists agree in that opinion, and they even extend the permission to those cases where no further violence is apprehended from those that steal our property, as, for example, where the thief runs away Azor, one of our Society, proves that point '

' But, sir, how much must the article be worth, to justify our proceeding to that extremity?'

' According to Reginald and Tanner, the article must be of great value in the estimation of a judicious man And so think Layman and Filiutius

' But, father, that is saying nothing to the purpose, where am I to find a judicious man' (a rare person to meet with at any time), in order to make this estimation? Why do they not settle upon an exact sum at once? '

Ay, indeed' retorted the monk, and was it so easy, think you, to adjust the comparative value between the life of a man, and a Christian man, too, and money? It is here I would have you feel the need of our casuists Show me any of your ancient fathers who will tell for how much money we may be allowed to kill a man What will they say, but *Non occides*—Thou shalt not kill?

And who, then, has ventured to fix that sum? I inquired

"Our great and incomparable Molina, he replied— the glory of our Society— who has, in his inimitable wisdom, estimated the life of a man at six or seven ducats, for which sum he assures us it is warrantable to kill a thief, even though he should run off , and he adds, that he would not venture to condemn that man as guilty of any sin who should kill another for taking away an article worth a crown, or even less—*unius aurei, vel minoris adhuc valoris* , which has led Escobar to lay it down, as a general rule, that a man may be killed quite regularly, according to Molina, for the value of a crownpiece '

O father,' cried I, where can Molina have got all this wisdom to enable him to determine a matter of such importance, without any aid from Scripture, the councils, or the fathers? It is quite evident that he has obtained an illumination peculiar to himself, and is far beyond St Augustine in the matter of homicide, as well as of grace Well, now, I suppose I may consider myself master of this chapter of morals, and I see perfectly that, with the exception of ecclesiastics, nobody need refrain from killing those who injure them in their property or reputation

'What say you? exclaimed the monk Do you, then, suppose that it would be reasonable that those, who ought of all men to be most respected, should alone be exposed to the insolence of the wicked? Our fathers have provided against that disorder, for Tanner declares that Churchmen, and even monks, are permitted to kill, for the purpose of defending not only their lives, but their property, and that of their community Molina, Escobar, Becan, Reginald, Layman, Lessius, and others, hold the same language Nay, according to our celebrated Father Lamy, priests and monks may lawfully prevent those who would injure them by calumnies from carrying their ill designs into effect, by putting them to death Care, however, must always be taken to direct the intention properly His words

are An ecclesiastic or a monk may warrantably kill a defamer who threatens to publish the scandalous crimes of his community or his own crimes when there is no other way of stopping him if for instance he is prepared to circulate his de famations *unless promptly despatched* For in these circumstances as the monk would be allowed to kill one who threatened to take his life he is also warranted to kill him who would deprive him of his reputation or his property in the same way as the men of the world

I was not aware of that said I in fact I have been accustomed simply enough to believe the very reverse without reflecting on the matter in conse quence of having heard that the Church had such an abhorrence of bloodshed as not even to permit ecclesiastical judges to attend in criminal cases

Never mind that he replied our Father Lamy *has completely proved the* doctrine I have laid down although with a humility which sits *uncommonly* well on so great a man he submits it to the judgement of his judicious readers Cara muel too our famous champion quoting it in his *Fundamental Theology* p 543 thinks it so certain that he declares the contrary opinion to be destitute of prob ability and draws some admirable conclusions from it such as the following which he calls the conclusion of conclusions—*conclusionum conclusio* That a priest not only may kill a slanderer but there are certain circumstances in which it may be his *duty* to do so—*etiam aliquando debet occidere* He examines a great many new questions on this principle such as the following for instance *May the Jesuits kill the Jansenists?*

A curious point of divinity that father! cried I I hold the Jansenists to be as good as dead men according to Father Lamy s doctrine

There now you are in the wrong said the monk Caramuel infers the very reverse from the same principles

And how so father?

Because he replied it is not in the power of the Jansenists to injure our reputation The Jansenists says he call the Jesuits *Pelagians* may they not be killed for that? No inasmuch as the Jansenists can no more obscure the glory of the Society than an owl can eclipse that of the sun on the contrary they have though against their intention enhanced it—*occidi non possunt quia nocere non potuerunt*

Ha father! do the lives of the Jansenists then depend on the contingency of their injuring your reputation? If so I reckon them far from being in a safe posi tion for supposing it should be thought in the slightest degree *probable* that they might do you some mischief why they are *killable* at once! You have only to draw up a syllogism in due form and with a direction of the intention you may des patch your man at once with a safe conscience Thrice happy must those hot spirits be who cannot bear with injuries to be instructed in this doctrine! But woe to the poor people who have offended them! Indeed father it would be better to have to do with persons who have no religion at all than with those who have been taught on this system For after all the intention of the wounder conveys no com fort to the wounded The poor man sees nothing of that secret direction of which you speak he is only sensible of the direction of the blow that is dealt him And I am by no means sure but a person would feel much less sorry to see himself bru tally killed by an infuriated villain than to find himself conscientiously stilettoed by a devotee To be plain with you father I am somewhat staggered at all this

and these questions of Father Lamy and Caramuel do not please me at all "

' How so?" cried the monk "Are you a Jansenist? '

"I have another reason for it,' I replied You must know I am in the habit of writing from time to time, to a friend of mine in the country, all that I can learn of the maxims of your doctors Now, although I do no more than simply report and faithfully quote their own words, yet I am apprehensive lest my letter should fall into the hands of some stray genius who may take into his head that I have done you injury, and may draw some mischievous conclusion from your premisses "

"Away! cried the monk, no fear of danger from that quarter, I ll give you my word for it Know that what our fathers have themselves printed, with the approbation of our superiors, it cannot be wrong to read nor dangerous to publish "

I write you, therefore, on the faith of this worthy father s word of honour But, in the meantime, I must stop for want of paper—not of passages, for I have got as many more in reserve, and good ones too, as would require volumes to contain them I am, &c

LETTER VIII

Paris, *May* 28, 1656

SIR,

You did not suppose that anybody would have the curiosity to know who we were, but it seems there are people who are trying to make it out, though they are not very happy in their conjectures Some take me for a doctor of the Sorbonne, others ascribe my letters to four or five persons, who, like me, are neither priests nor Churchmen All these false surmises convince me that I have succeeded pretty well in my object, which was to conceal myself from all but yourself and the worthy monk, who still continues to bear with my visits, while I still contrive, though with considerable difficulty, to bear with his conversations I am obliged, however, to restrain myself, for, were he to discover how much I am shocked at his communications, he would discontinue them and thus put it out of my power to fulfil the promise I gave you, of making you acquainted with their morality You ought to think a great deal of the violence which I thus do to my own feelings It is no easy matter, I can assure you, to stand still and see the whole system of Christian ethics undermined by such a set of monstrous principles, without daring to put in a word of flat contradiction against them But, after having borne so much for your satisfaction, I am resolved I shall burst out for my own satisfaction in the end, when his stock of information has been exhausted Meanwhile, I shall repress my feelings as much as I possibly can for I find that the more I hold my tongue, he is the more communicative The last time I saw him, he told me so many things that I shall have some difficulty in repeating them all On the point of restitution you will find they have some most convenient principles For, however the good monk palliates his maxims, those which I am about to lay before you really go to sanction corrupt judges, usurers, bankrupts, thieves, prostitutes and sorcerers—all of whom are most liberally absolved from the obligation of restoring their ill gotten gains It was thus the monk resumed the conversation

At the commencement of our interviews I engaged to explain to you the maxims of our authors for all ranks and classes and you have already seen those that relate to beneficiaries to priests to monks to domestics and to gentlemen Let us now take a cursory glance at the remaining and begin with the judges

Now I am going to tell you one of the most important and advantageous maxims which our fathers have laid down in their favour Its author is the learned Castro Palao one of our four and twenty elders His words are May a judge in a question of right and wrong pronounce according to a probable opinion in preference to the more probable opinion? He may even though it should be con trary to his own judgement—*imo contra propriam opinionem*

Well father cried I that is a very fair commencement! The judges surely, are greatly obliged to you and I am surprised that they should be so hostile as we have sometimes observed to your probabilities seeing these are so favourable to them For it would appear from this that you give them the same power over men s fortunes as you have given to yourselves over their consciences

You perceive we are far from being actuated by self interest returned he we have had no other end in view than the repose of their consciences and to the same useful purpose has our great Molina devoted his attention in regard to the presents which may be made them To remove any scruples which they might entertain in accepting of these on certain occasions he has been at the pains to draw out a list of all those cases in which bribes may be taken with a good con science provided at least there be no special law forbidding them He says Judges may receive presents from parties when they are given them either for friendship s sake or in gratitude for some former act of justice or to induce them to give justice in future or to oblige them to pay particular attention to their case or to engage them to despatch it promptly The learned Escobar delivers himself to the same effect If there be a number of persons none of whom have more right than another to have their causes disposed of will the judge who accepts of something from one of them on condition—*ex pacto*—of taking up his cause first be guilty of sin? Certainly not according to Layman for in common equity he does no injury to the rest by granting to one in consideration of his present what he was at liberty to grant to any of them he pleased and besides being under an equal obligation to them all in respect of their right he becomes more obliged to the individual who furnished the donation who thereby acquired for himself a preference above the rest—a preference which seems capable of a pecuniary valuation—*quae obligatio videtur pretio æstimabilis*

May it please your reverence said I after such a permission I am surprised that the first magistrates of the kingdom should know no better For the first presi dent has actually carried an order in Parliament to prevent certain clerks of court from taking money for that very sort of preference—a sign that he is far from think ing it allowable in judges and everybody has applauded this as a reform of great benefit to all parties

The worthy monk was surprised at this piece of intelligence and replied Are you sure of that? I heard nothing about it Our opinion recollect is only prob able the contrary is probable also

To tell you the truth father said I people think that the first president has acted more than probably well and that he has thus put a stop to a course of public corruption which has been too long winked at

"I am not far from being of the same mind,' returned he, "but let us waive that point, and say no more about the judges "

"You are quite right, sir, said I, "indeed, they are not half thankful enough for all you have done for them '

'That is not my reason,' said the father, but there is so much to be said on all the different classes that we must study brevity on each of them Let us now say a word or two about men of business You are aware that our great difficulty with these gentlemen is to keep them from usury—an object to accomplish which our fathers have been at particular pains, for they hold this vice in such abhorrence that Escobar declares it is heresy to say that usury is no sin', and Father Bauny has filled several pages of his *Summary of Sins* with the pains and penalties due to usurers He declares them '*infamous during their life, and unworthy of sepulture after their death*'"

O dear!' cried I, "I had no idea he was so severe '

He can be severe enough when there is occasion for it," said the monk, ' but then this learned casuist, having observed that some are allured into usury merely from the love of gain, remarks in the same place that he would confer no small obligation on society, who, while he guarded it against the evil effects of usury, and of the sin which gives birth to it, would suggest a method by which one s money might secure as large, if not a larger profit, in some honest and lawful employment than he could derive from usurious dealings

' Undoubtedly, father, there would be no more usurers after that "

"Accordingly," continued he, our casuist has suggested a general method for all sorts of persons—gentlemen, presidents, councillors,' &c , and a very simple process it is, consisting only in the use of certain words which must be pronounced by the person in the act of lending his money, after which he may take his interest for it without fear of being a usurer, which he certainly would be on any other plan

"*And pray what may those mysterious words be, father?* '

' I will give you them exactly in his own words,' said the father, "for he has written his *Summary* in French, you know, that it may be understood by everybody, as he says in the preface The person from whom the loan is asked must answer, then, in this manner I have got no money to *lend*, I have got a little, however, to lay out for an honest and lawful profit If you are anxious to have the sum you mention in order to make something of it by your industry, dividing the profit and loss between us, I may perhaps be able to accommodate you But now I think of it, as it may be a matter of difficulty to agree about the profit, if you will secure me a certain portion of it, and give me so much for my principal, so that it incur no risk, we may come to terms much sooner, and you shall touch the cash immediately ' Is not that an easy plan for gaining money without sin? And has not Father Bauny good reason for concluding with these words Such, in my opinion, is an excellent plan by which a great many people, who now provoke the just indignation of God by their usuries, extortions, and illicit bargains, might save themselves, in the way of making good, honest, and legitimate profits ?

O sir! ' I exclaimed, ' what potent words these must be! Doubtless they must possess some latent virtue to chase away the demon of usury which I know nothing of, for, in my poor judgement, I always thought that that vice consisted in recovering more money that what was lent

You know little about it indeed he replied Usury according to our fathers consists in little more than the intention of taking the interest as usurious Escobar accordingly shows you how you may avoid usury by a simple shift of the intention It would be downright usury says he to take interest from the borrower if we should exact it as due in point of justice but if only exacted as due in point of gratitude it is not usury Again it is not lawful to have directly the intention of profiting by the money lent but to claim it through the medium of the benevolence of the borrower—*media benevolentia*—is not usury These are subtle methods but to my mind the best of them all (for we have a great choice of them) is that of the Mohatra bargain

The Mohatra father!

You are not acquainted with it I see returned he The name is the only strange thing about it Escobar will explain it to you The Mohatra bargain is effected by the needy person purchasing some goods at a high price and on credit in order to sell them over again at the same time and to the same merchant for ready money and at a cheap rate This is what we call the Mohatra—a sort of bargain you perceive by which a person receives a certain sum of ready money by becoming bound to pay more

But sir I really think nobody but Escobar has employed such a term as that is it to be found in any other book?

How little you do know of what is going on to be sure! cried the father Why the last work on theological morality printed at Paris this very year speaks of the Mohatra and learnedly too It is called *Epilogus Summarum* and is an abridgment of all the summaries of divinity—extracted from Suarez Sanchez Lessius Fagundez Hurtado and other celebrated casuists as the title bears There you will find it said on p 54 that the Mohatra bargain takes place when a man who has occasion for twenty pistoles purchases from a merchant goods to the amount of thirty pistoles payable within a year and sells them back to him on the spot for twenty pistoles ready money This shows you that the Mohatra is not such an unheard of term as you supposed

But father is that sort of bargain lawful?

Escobar replied he tells us in the same place that there are laws which prohibit it under very severe penalties

It is useless then I suppose?

Not at all Escobar in the same passage suggests expedients for making it lawful It is so even though the principal intention both of the buyer and seller is to make money by the transaction provided the seller in disposing of the goods does not exceed their highest price and in re purchasing them does not go below their lowest price and that no previous bargain has been made expressly or otherwise Lessius however maintains that even though the merchant has sold his goods with the intention of re purchasing them at the lowest price he is not bound to make restitution of the profit thus acquired unless perhaps as an act of charity in the case of the person from whom it had been exacted being in poor circumstances and not even then if he cannot do it without inconvenience—*si commode non potest* This is the utmost length to which they could go

Indeed sir said I any further indulgence would I should think be rather too much

Oh our fathers know very well when it is time for them to stop! cried the

monk "So much, then, for the utility of the Mohatra I might have mentioned several other methods, but these may suffice, and I have now to say a little in regard to those who are in embarrassed circumstances Our casuists have sought to relieve them, according to their condition of life For, if they have not enough of property for a decent maintenance, and at the same time for paying their debts, they permit them to secure a portion by making a bankruptcy with their creditors This has been decided by Lessius, and confirmed by Escobar, as follows 'May a person who turns bankrupt, with a good conscience keep back as much of his personal estate as may be necessary to maintain his family in a respectable way—*ne indecore vivat*? I hold, with Lessius, that he may, even though he may have acquired his wealth unjustly and by notorious crimes—*ex injustitia et notorio delicto,* only, in this case, he is not at liberty to retain so large an amount as he otherwise might '"

'Indeed, father! what a strange sort of charity is this, to allow property to remain in the hands of the man who has acquired it by rapine, to support him in his extravagance rather than go into the hands of his creditors, to whom it legitimately belongs! '

It is impossible to please everybody," replied the father, and we have made it our particular study to relieve these unfortunate people This partiality to the poor has induced our great Vasquez, cited by Castro Palao, to say that if one saw a thief going to rob a poor man, it would be lawful to divert him from his purpose by pointing out to him some rich individual, whom he might rob in place of the other ' If you have not access to Vasquez or Castro Palao, you will find the same thing in your copy of Escobar, for, as you are aware, his work is little more than a compilation from twenty four of the most celebrated of our fathers You will find it in his treatise, entitled *The Practice of our Society, in the Matter of Charity towards our Neighbours*

'A very singular kind of charity this, ' I observed, to save one man from suffering loss, by inflicting it upon another! But I suppose that, to complete the charity, the charitable adviser would be bound in conscience to restore to the rich man the sum which he had made him lose? '

Not at all, sir, returned the monk, for he did not rob the man—he only advised the other to do it But only attend to this notable decision of Father Bauny, on a case which will still more astonish you, and in which you would suppose there was a much stronger obligation to make restitution Here are his identical words A person asks a soldier to beat his neighbour, or to set fire to the barn of a man that has injured him The question is whether, in the essence of the soldier, the person who employed him to commit these outrages is bound to make reparation out of his own pocket for the damage that has followed? *My opinion is that* he is not For none can be held bound to restitution, where there has been no violation of justice, and is justice violated by asking another to do us a favour? As to the nature of the request which he made, he is at liberty either to acknowledge or deny it, to whatever side he may incline, it is a matter of mere choice, nothing obliges him to it, unless it may be the goodness gentleness and easiness of his disposition If the soldier, therefore, makes no reparation for the mischief he has done, it ought not to be exacted from him at whose request he injured the innocent '

This sentence had very nearly broken up the whole conversation, for I was on

the point of bursting into a laugh at the idea of the *goodness and gentleness* of a burner of barns and at these strange sophisms which would exempt from the duty of restitution the principal and real incendiary whom the civil magistrate would not exempt from the halter But had I not restrained myself the worthy monk who was perfectly serious would have been displeased he proceeded therefore without any alteration of countenance in his observations

From such a mass of evidence you ought to be satisfied now of the futility of your objections but we are losing sight of our subject To revert then to the succour which our fathers apply to persons in straitened circumstances Lessius among others maintains that it is lawful to steal not only in a case of extreme necessity but even where the necessity is *grave* though not extreme

This is somewhat startling father said I There are very few people in this world who do not consider their cases of necessity to be *grave* ones and to whom accordingly you would not give the right of stealing with a good conscience And though you should restrict the permission to those only who are really and truly in that condition you open the door to an infinite number of petty larcenies which the magistrates would punish in spite of your *grave necessity* and which you ought to repress on a higher principle—you who are bound by your office to be the conservators not of justice only but of charity between man and man a grace which this permission would destroy For after all now is it not a violation of the law of charity and of our duty to our neighbour to deprive a man of his property in order to turn it to our own advantage? Such at least is the way I have been taught to think hitherto

That will not always hold true replied the monk for our great Molina has taught us that the rule of charity does not bind us to deprive ourselves of a profit in order thereby to save our neighbour from a corresponding loss He advances this in corroboration of what he had undertaken to prove— that one is not bound in conscience to restore the goods which another had put into his hands in order to cheat his creditors Lessius holds the same opinion on the same ground Allow me to say sir that you have too little compassion for people in distress Our fathers have had more charity than that comes to they render ample justice to the poor as well as the rich and I may add to sinners as well as saints For though far from having any predilection for criminals they do not scruple to teach that the property gained by crime may be lawfully retained No person says Lessius speaking generally is bound either by the law of nature or by positive laws (that is *by any law*) to make restitution of what has been gained by committing a criminal action such as adultery even though that action is contrary to justice For as Escobar comments on this writer though the property which a woman acquires by adultery is certainly gained in an illicit way yet once acquired the possession of it is lawful—*quamvis mulier illicite acquisat licite tamen retinet acquisita* It is on this principle that the most celebrated of our writers have formally decided that the bribe received by a judge from one of the parties who has a bad case in order to procure an unjust decision in his favour the money got by a soldier for killing a man or the emoluments gained by infamous crimes may be legitimately retained Escobar who has collected this from a number of our authors lays down this general rule on the point that the means acquired by infamous courses such as murder unjust decisions profligacy &c are legitimately possessed and none are obliged to restore them And further they may dispose of what they have

received for homicide, profligacy, &c, as they please, for the possession is just, and they have acquired a propriety in the fruits of their iniquity '

'My dear father,' cried I, 'this is a mode of acquisition which I never heard of before, and I question much if the law will hold it good, or if it will consider assassination, injustice, and adultery, as giving valid titles to property "

I do not know what your law books may say on the point," returned the monk, ' but I know well that our books, which are the genuine rules for conscience, bear me out in what I say It is true they make one exception, in which restitution is positively enjoined, that is, in the case of any receiving money from those who have no right to dispose of their property such as *minors and monks* Unless, says the great Molina, 'a woman has received money from one who cannot dispose of it, such as a monk or a minor—*nisi mulier accepisset ab eo qui alienare non potest, ut a religioso et filio familias* In this case she must give back the money ' And so says Escobar "

'May it please your reverence, ' said I, "the monks, I see, are more highly favoured in this way than other people '

"By no means, he replied, ' have they not done as much generally for all minors, in which class monks may be viewed as continuing all their lives? It is barely an act of justice to make them an exception, but with regard to all other people, there is no obligation whatever to refund to them the money received from them for a criminal action For, as has been amply shown by Lessius, a wicked action may have its price fixed in money, by calculating the advantage received by the person who orders it to be done and the trouble taken by him who carries it into execution, on which account the latter is not bound to restore the money he got for the deed, whatever that may have been—homicide, injustice, or a foul act (for such are the illustrations which he uniformly employs in this question), unless he obtained the money from those having no right to dispose of their property You may object, perhaps, that he who has obtained money for a piece of wickedness is sinning and, therefore, ought neither to receive nor retain it But I reply that, after the thing is done, there can be no sin either in giving or in receiving payment for it The great Filiutius enters still more minutely into details, remarking that a man is *bound in conscience* to vary his payments for actions of this sort, according to the different conditions of the individuals who commit them, and some may bring a higher price than others This he confirms by very solid arguments '

He then pointed out to me, in his authors, some things of this nature so indelicate that I should be ashamed to repeat them, and indeed the monk himself, who is a good man, would have been horrified at them himself were it not for the profound respect which he entertains for his fathers, and which makes him receive with veneration everything that proceeds from them Meanwhile, I held my tongue, not so much with the view of allowing him to enlarge on this matter as from pure astonishment at finding the books of men in holy orders stuffed with sentiments at once so horrible, so iniquitous, and so silly He went on, therefore, without interruption in his discourse, concluding as follows

' From these premisses, our illustrious Molina decides the following question (and after this, I think you will have got enough If one has received money to perpetrate a wicked action, is he obliged to restore it? We must distinguish here, says this great man, if he has not done the deed, he must give back the cash, if he

has he is under no such obligation' Such are some of our principles touching restitution You have got a great deal of instruction to day and I should like now to see what proficiency you have made Come then answer me this question Is a judge who has received a sum of money from one of the parties before him in order to pronounce a judgement in his favour obliged to make restitution?

You were just telling me a little ago father that he was not

I told you no such thing replied the father did I express myself so generally? I told you he was not bound to make restitution provided he succeeded in gaining the cause for the party who had the wrong side of the question But if a man has justice on his side would you have him to purchase the success of his cause which is his legitimate right? You are very unconscionable Justice look you is a debt which the judge owes and therefore he cannot sell it but he cannot be said to owe injustice and therefore he may lawfully receive money for it All our leading authors accordingly agree in teaching that though a judge is bound to restore the money he had received for doing an act of justice unless it was given him out of mere generosity he is not obliged to restore what he has received from a man in whose favour he has pronounced an unjust decision

This preposterous decision fairly dumbfounded me and while I was musing on its pernicious tendencies the monk had prepared another question for me Answer me again said he with a little more circumspection Tell me now if a man who deals in divination is obliged to make restitution of the money he has acquired in the exercise of his art?

Just as you please your reverence said I

Eh' what'— just as I please' Indeed but you are a pretty scholar' It would seem according to your way of talking that the truth depended on our will and pleasure I see that in the present case you would never find it out yourself so I must send you to Sanchez for a solution of the problem—no less a man than Sanchez In the first place he makes a distinction between the case of the diviner who has recourse to astrology and other natural means and that of another who employs the diabolical art In the one case he says the diviner is bound to make restitution in the other he is not Now guess which of them is the party bound?

It is not difficult to find out that said I

I see what you mean to say he replied You think that he ought to make restitution in the case of his having employed the agency of demons But you know nothing about it it is just the reverse If says Sanchez the sorcerer has not taken care and pains to discover by means of the devil what he could not have known otherwise he must make restitution—*si nullam operam apposuit ut arte diaboli id sciret* but if he has been at that trouble he is not obliged

And why so father?

Don t you see? returned he It is because men may truly divine by the aid of the devil whereas astrology is a mere sham

But sir should the devil happen not to tell the truth (and he is not much more to be trusted than astrology) the magician must I should think for the same reason be obliged to make restitution?

Not always replied the monk *Distinguo* as Sanchez says here If the magician be ignorant of the diabolic art—*si sit artis diabolicæ ignarus*—he is bound to restore but if he is an expert sorcerer and has done all in his power to arrive at the

truth, the obligation ceases, for the industry of such a magician may be estimated at a certain sum of money

There is some sense in that," I said, for this is an excellent plan to induce sorcerers to aim at proficiency in their art, in the hope of making an honest livelihood, as you would say, by faithfully serving the public "

You are making a jest of it, I suspect, ' said the father ' that is very wrong If you were to talk in that way in places where you were not known, some people might take it amiss and charge you with turning sacred subjects into ridicule

That, father, is a charge from which I could very easily vindicate myself, for certain I am that whoever will be at the trouble to examine the true meaning of my words will find my object to be precisely the reverse, and perhaps, sir, before our conversations are ended, I may find an opportunity of making this very amply apparent

Ho, ho," cried the monk, ' there is no laughing in your head now

"I confess, said I, ' that the suspicion that I intended to laugh at things sacred would be as painful for me to incur as it would be unjust in any to entertain it

"I did not say it in earnest, returned the father, but let us speak more seriously "

I am quite disposed to do so, if you prefer it, that depends upon you, father But I must say, that I have been astonished to see your friends carrying their attentions to all sorts and conditions of men so far as even to regulate the legitimate gains of sorcerers '

One cannot write for too many people," said the monk, "nor be too minute in particularising cases, nor repeat the same things too often in different books You may be convinced of this by the following anecdote, which is related by one of the gravest of our fathers, as you may well suppose, seeing he is our present Provincial—the reverend Father Cellot We know a person, says he, who was carrying a large sum of money in his pocket to restore it, in obedience to the orders of his confessor, and who, stepping into a bookseller s shop by the way, inquired if there was anything new?—*numquid novi?*—when the bookseller showed him a book on moral theology, recently published, and turning over the leaves carelessly, and without reflection, he lighted upon a passage describing his own case, and saw that he was under no obligation to make restitution upon which, relieved from the burden of his scruples, he returned home with a purse no less heavy, and a heart much lighter, than when he left it—*abjecta scrupuli sarcina, retento auri pondere, levior domum repetiit*

Say, after hearing that, if it is useful or not to know our maxims? Will you laugh at them now? or rather, are you not prepared to join with Father Cellot in the pious reflection which he makes on the blessedness of that incident? Accidents of that kind, he remarks, are, with God, the effect of his providence, with the guardian angel, the effect of his good guidance, with the individuals to whom they happen, the effect of their predestination From all eternity, God decided that the golden chain of their salvation should depend on such and such an author, and not upon a hundred others who say the same thing, because they never happen to meet with them Had that man not written, this man would not have been saved All, therefore, who find fault with the multitude of our authors, we would beseech, in the bowels of Jesus Christ, to beware of envying others those books which the eternal election of God and the blood of Jesus Christ have pur-

chased for them! Such are the eloquent terms in which this learned man proves so successfully the proposition which he had advanced namely How useful it must be to have a great many writers on moral theology—*quam utile sit de theologia morali multos scribere?*

Father said I I shall defer giving you my opinion of that passage to another opportunity in the meantime I shall only say that as your maxims are so useful and as it is so important to publish them you ought to continue to give me further instruction in them For I can assure you that the person to whom I send them shows my letters to a great many people Not that we intend to avail ourselves of them in our own case but indeed we think it will be useful for the world to be informed about them

Very well rejoined the monk you see I do not conceal them and in continuation I am ready to furnish you at our next interview with an account of the comforts and indulgences which our fathers allow with the view of rendering salvation easy and devotion agreeable so that in addition to what you have hitherto learned as to particular conditions of men you may learn what applies in general to all classes and thus you will have gone through a complete course of instruction So saying the monk took his leave of me I am &c

P S I have always forgot to tell you that there are different editions of Escobar Should you think of purchasing him I would advise you to choose the Lyons edition having on the title page the device of a lamb lying on a book sealed with seven seals or the Brussels edition of 1651 Both of these are better and larger than the previous editions published at Lyons in the years 1644 and 1646

LETTER IX

Paris July 3 1656

SIR

I shall use as little ceremony with you as the worthy monk did with me when I saw him last The moment he perceived me he came forward with his eyes fixed on a book which he held in his hand and accosted me thus Would you not be infinitely obliged to any one who should open to you the gates of paradise? Would you not give millions of gold to have a key by which you might gain admittance whenever you thought proper? You need not be at such expense here is one—here are a hundred for much less money

At first I was at a loss to know whether the good father was reading or talking to me but he soon put the matter beyond doubt by adding

These sir are the opening words of a fine book written by Father Barry of our Society for I never give you anything of my own

What book is it? asked I

Here is its title he replied *Paradise opened to Philagio in a Hundred Devotions to the Mother of God easily practised*

Indeed father! and is each of these easy devotions a sufficient passport to heaven?

It is returned he Listen to what follows The devotions to the Mother of God which you will find in this book are so many celestial keys which will open

wide to you the gates of paradise, provided you practise them , and, accordingly, he says at the conclusion, 'that he is satisfied if you practise only one of them "

' Pray, then, father, do teach me one of the easiest of them "

' They are all easy," he replied, ' for example— Saluting the Holy Virgin when you happen to meet her image—saying the little chaplet of the pleasures of the Virgin—fervently pronouncing the name of Mary—commissioning the angels to bow to her for us—*wishing to build her as many churches as all the monarchs on* earth have done—bidding her good morrow every morning, and good night in the evening—saying the *Ave Maria* every day, in honour of the heart of Mary — which last devotion, he says, possesses the additional virtue of securing us the heart of the Virgin "

'But, father, said I, "only provided we give her our own in return, I presume? '

"That,' he replied, "is not absolutely necessary, when a person is too much attached to the world Hear Father Barry Heart for heart would, no doubt, be highly proper, but yours is rather too much attached to the world, too much bound up in the creature, so that I dare not advise you to offer, at present, that *poor little slave* which you call your heart ' And so he contents himself with the *Ave Maria* which he had prescribed "

"Why, this is extremely easy work,' said I, and I should really think that nobody will be damned after that '

Alas! said the monk, I see you have no idea of the hardness of some people's hearts There are some, sir, who would never engage to repeat, every day, even these simple words, *Good day, Good evening*, just because such a practice would require some exertion of memory And, accordingly, it became necessary for Father Barry to furnish them with expedients still easier, such as wearing a chaplet night and day on the arm, in the form of a bracelet, or carrying about one s person a rosary, or an image of the Virgin And, tell me now,' as Father Barry says, 'if I have not provided you with easy devotions to obtain the good graces of Mary?

Extremely easy indeed, father, I observed

"Yes, he said, it is as much as could possibly be done, and I think should be quite satisfactory For he must be a wretched creature indeed, who would not spare a single moment in all his lifetime to put a chaplet on his arm, or a rosary in his pocket, and thus secure his salvation, and that, too, with so much certainty that none who have tried the experiment have ever found it to fail, in whatever way they may have lived, though, let me add, we exhort people not to omit holy living Let me refer you to the example of this, given at p 34, it is that of a female who, while she practised daily the devotion of saluting the images of the Virgin, spent all her days in mortal sin, and yet was saved after all, by the merit of that single devotion "

' And how so? ' cried I

Our Saviour, ' he replied, 'raised her up again, for the very purpose of showing it So certain it is that none can perish who practise any one of these devotions '

My dear sir, ' I observed, I am fully aware that the devotions to the Virgin are a powerful means of salvation, and that the least of them, if flowing from the exercise of faith and charity, as in the case of the saints who have practised them, are of great merit, but to make persons believe that, by practising these without reforming their wicked lives, they will be converted by them at the hour of death, or that God will raise them up again, does appear calculated rather to keep sinners

going on in their evil courses by deluding them with false peace and foolhardy confidence than to draw them off from sin by that genuine conversion which grace alone can effect

What does it matter replied the monk by what road we enter paradise provided we do enter it? as our famous Father Binet formerly our Provincial remarks on a similar subject in his excellent book *On the Mark of Predestination* Be it by hook or by crook as he says what need we care if we reach at last the celestial city

Granted said I but the great question is if we will get there at all

The Virgin will be answerable for that returned he so says Father Barry in the concluding lines of his book If at the hour of death the enemy should happen to put in some claim upon you and occasion disturbance in the little commonwealth of your thoughts you have only to say that Mary will answer for you and that he must make his application to her

But father it might be possible to puzzle you were one disposed to push the question a little further Who for example has assured us that the Virgin will be answerable in this case?

Father Barry will be answerable for her he replied As for the profit and happiness to be derived from these devotions he says I will be answerable for that I will stand bail for the good Mother

But father who is to be answerable for Father Barry?

How! cried the monk for Father Barry? is he not a member of our Society and do you need to be told that our Society is answerable for all the books of its members? It is highly necessary and important for you to know about this There is an order in our Society by which all booksellers are prohibited from printing any work of our fathers without the approbation of our divines and the permission of our superiors This regulation was passed by Henry III 10th May 1583 and confirmed by Henry IV 20th December 1603 and by Louis XIII 14th February 1612 so that the whole of our body stands responsible for the publications of each of the brethren This is a feature quite peculiar to our community And in consequence of this not a single work emanates from us which does not breathe the spirit of the Society That sir is a piece of information quite *apropos*

My good father said I you oblige me very much and I only regret that I did not know this sooner as it will induce me to pay considerably more attention to your authors

I would have told you sooner he replied had an opportunity offered I hope however you will profit by the information in future and in the meantime let us prosecute our subject The methods of securing salvation which I have mentioned are in my opinion very easy very sure and sufficiently numerous but it was the anxious wish of our doctors that people should not stop short at this first step where they only do what is absolutely necessary for salvation and nothing more Aspiring as they do without ceasing after the greater glory of God they sought to elevate men to a higher pitch of piety and as men of the world are generally deterred from devotion by the strange ideas they have been led to form of it by some people we have deemed it of the highest importance to remove this obstacle which meets us at the threshold In this department Father Le Moine has acquired much fame by his work entitled *Devotion Made Easy* composed for this very purpose The picture which he draws of devotion in this work is perfectly

charming None ever understood the subject before him Only hear what he says *in the beginning of his work 'Virtue has never as yet been seen aright*, no portrait of her, hitherto produced, has borne the least verisimilitude It is by no means surprising that so few have attempted to scale her rocky eminence She has been held up as a cross tempered dame, whose only delight is in solitude, she has been associated with toil and sorrow, and, in short, represented as the foe of sports and diversions, which are, in fact, the flowers of joy and the seasoning of life '"

But, father, I am sure, I have heard, at least, that there have been great saints who led extremely austere lives

No doubt of that," he replied, but still, to use the language of the doctor, there have always been a number of genteel saints, and well bred devotees , and this difference in their manners, mark you, arises entirely from a difference of humours 'I am far from denying, says my author, *that there are devout persons* to be met with', pale and melancholy in their temperament, fond of silence and retirement, with phlegm instead of blood in their veins, and with faces of clay, but there are many others of a happier complexion, and who possess that sweet and warm humour, that genial and rectified blood, which is the true stuff that joy is made of '

You see,' resumed the monk, that the love of silence and retirement is not common to all devout people, and that, as I was saying, this is the effect rather of their complexion than their piety Those austere manners to which you refer are, in fact, properly the character of a savage and barbarian, and, accordingly, you will find them ranked by Father Le Moine among the ridiculous and brutal manners of *a moping idiot The following is the description he has drawn of one of these in* the seventh book of his *Moral Pictures* 'He has no eyes for the beauties of art or nature Were he to indulge in anything that gave him pleasure, he would consider himself oppressed with a grievous load On festival days, he retires to hold fellowship with the dead He delights in a grotto rather than a palace, and prefers the stump of a tree to a throne As to injuries and affronts, he is as insensible to them as if he had the eyes and ears of a statue Honour and glory are idols with whom he has no acquaintance, and to whom he has no incense to offer To him a beautiful woman is no better than a spectre, and those imperial and commanding looks—those charming tyrants who hold so many slaves in willing and chainless servitude—have no more influence over his optics than the sun over those of owls, &c

Reverend sir,' said I, had you not told me that Father Le Moine was the author of that description, I declare I would have guessed it to be the production of some profane fellow who had drawn it expressly with the view of turning the *saints into ridicule For if that is not the picture of a man entirely denied to those* feelings which the Gospel obliges us to renounce, I confess that I know nothing of the matter '

' You may now perceive, then, the extent of your ignorance," he replied, for these are the features of a feeble, uncultivated mind, destitute of those virtuous and natural affections which it ought to possess, as Father Le Moine says at the close of that description Such is his way of teaching Christian virtue and philoso phy, as he announces in his advertisement, and, in truth, it cannot be denied that this method of treating devotion is much more agreeable to the taste of the world than the old way in which they went to work before our times

There can be no comparison between them was my reply and I now begin to hope that you will be as good as your word

You will see that better by and by returned the monk Hitherto I have only spoken of piety in general but just to show you more in detail how our fathers have disencumbered it of its toils and troubles would it not be most consoling to the ambitious to learn that they may maintain genuine devotion along with an inordinate love of greatness?

What father! even though they should run to the utmost excess of ambition?

Yes he replied for this would be only a venial sin unless they sought after greatness in order to offend God and injure the State more effectually Now venial sins do not preclude a man from being devout as the greatest saints are not exempt from them Ambition says Escobar which consists in an inordinate appetite for place and power is of itself a venial sin but when such dignities are coveted for the purpose of hurting the commonwealth or having more opportunity to offend God these adventitious circumstances render it mortal

Very savoury doctrine indeed father

And is it not still more savoury, continued the monk, for misers to be told by the same authority that the rich are not guilty of mortal sin by refusing to give alms out of their superfluity to the poor in the hour of their greatest need?—*scio in gravi pauperum necessitate divites non dando superflua non peccare mortaliter*

Why truly said I if that be the case I give up all pretension to skill in the science of sins

To make you still more sensible of this returned he you have been accustomed to think I suppose that a good opinion of one s self and a complacency in one s own works is a most dangerous sin? Now will you not be surprised if I can show you that such a good opinion even though there should be no foundation for it is so far from being a sin that it is on the contrary *the gift of God?*

Is it possible father?

That it is said the monk and our good Father Garasse shows it in his French work entitled *Summary of the Capital Truths of Religion* It is a result of commutative justice that all honest labour should find its recompense either in praise or in self satisfaction When men of good talents publish some excellent work they are justly remunerated by public applause But when a man of weak parts has wrought hard at some worthless production and fails to obtain the praise of the public in order that his labour may not go without its reward God imparts to him a personal satisfaction which it would be worse than barbarous injustice to envy him It is thus that God who is infinitely just has given even to frogs a certain complacency in their own croaking

Very fine decisions in favour of vanity ambition and avarice! cried I and envy father will it be more difficult to find an excuse for it?

That is a delicate point he replied We require to make use here of Father Bauny s distinction which he lays down in his *Summary of Sins* Envy of the spiritual good of our neighbour is mortal but envy of his temporal good is only venial

And why so father?

You shall hear said he For the good that consists in temporal things is so

slender, and so insignificant in relation to heaven, that it is of no consideration in the eyes of God and His saints "

' But, father, if temporal good is so *slender*, and of so little consideration, how do you come to permit men s lives to be taken away in order to preserve it?

"You mistake the matter entirely," returned the monk, ' you were told that temporal good was of no consideration in the eyes of God, but not in the eyes of men "

That idea never occurred to me," I replied, and now, it is to be hoped that, in virtue of these same distinctions, the world will get rid of mortal sins altogether "

Do not flatter yourself with that, said the father, there are still such things as mortal sins—there is sloth, for example

' Nay, then, father dear! I exclaimed, after that, farewell to all 'the joys of life!'"

'Stay," said the monk, 'when you have heard Escobar s definition of that vice, you will perhaps change your tone Sloth, he observes, lies in grieving that spiritual things are spiritual, as if one should lament that the sacraments are the sources of grace, which would be a mortal sin "

O my dear sir! cried I, "I don t think that anybody ever took it into his head to be slothful in that way '

And accordingly, he replied, "Escobar afterwards remarks I must confess that it is very rarely that a person falls into the sin of sloth You see now how important it is to *define* things properly?

' Yes, father, and this brings to my mind your other definitions about assassinations, ambuscades, and superfluities But why have you not extended your method to all cases, and given definitions of all vices in your way, so that people may no longer sin in gratifying themselves?

It is not always essential," he replied, to accomplish that purpose by changing the definitions of things I may illustrate this by referring to the subject of good cheer, which is accounted one of the greatest pleasures of life, and which Escobar thus sanctions in his *Practice according to our Society* 'Is it allowable for a person to eat and drink to repletion, unnecessarily, and solely for pleasure? Certainly he may, according to Sanchez, provided he does not thereby injure his health, because the natural appetite may be permitted to enjoy its proper functions ' '

Well, father, that is certainly the most complete passage, and the most finished maxim in the whole of your moral system! What comfortable inferences may be drawn from it! Why, and is gluttony, then, not even a venial sin?

Not in the shape I have just referred to, he replied, ' but, according to the same author, it would be a venial sin were a person to gorge himself, unnecessarily, with eating and drinking, to such a degree as to produce vomiting So much for that point I would now say a little about the facilities we have invented for avoiding sin in worldly conversations and intrigues One of the most embarrassing of these cases is how to avoid telling lies, particularly when one is anxious to induce a belief in what is false In such cases, our doctrine of equivocations has been found of admirable service, according to which as Sanchez has it, it is permitted to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves

"I know that already, father, said I

We have published it so often,' continued he, that at length, it seems, every-

body knows of it But do you know what is to be done when no equivocal words can be got?

No father

I thought as much said the Jesuit this is something new sir I mean the doctrine of mental re ervations A man may swear as Sanchez says in the same place that he never did such a thing (though he actually did it) meaning within himself that he did not do so on a certain day or before he was born or under standing any other such circumstance while the words which he employs have no such sense as would discover his meaning And this is very convenient in many cases and quite innocent when necessary or conducive to one s health honour or advantage

Indeed father! is that not a lie and perjury to boot?

No said the father Sanchez and Filiutius prove that it is not for says the latter it is the intention that determines the quality of the action And he sug gests a still surer method for avoiding falsehood which is this *After saying* aloud I swear that I have not done that to add in a low voice to day or after saying aloud I swear to interpose in a whisper that I say and then continue aloud that I have done that This you perceive is telling the truth

I grant it said I it might possibly however be found to be telling the truth in a low key and falsehood in a loud one besides I should be afraid that many people might not have sufficient presence of mind to avail themselves of these methods

Our doctors replied the Jesuit have taught in the same passage for the benefit of such as might not be expert in the use of these reservations that no more is required of them to avoid lying than simply to say that they have not done what they have done provided they have in general the intention of giving to their language the sense which an *able man* would give to it Be candid now and confess if you have not often felt yourself embarrassed in consequence of not knowing this?

Sometimes said I

And will you not also acknowledge continued he that it would often prove very convenient to be absolved in conscience from keeping certain en gagements one may have made?

The most convenient thing in the world! I replied

Listen then to the general rule laid down by E cobar Promises are not bind ing when the person in making them had no intention to bind himself Now it seldom happens that any have such an intention unless when they confirm their promises by an oath or contract so that when one simply says I will do it he means that he will do it if he does not change his mind for he does not wish by saying that to deprive himself of his liberty He gives other rules in the same strain which you may consult for yourself and tells us in conclusion that all this is taken from Molina and our other authors and is therefore settled beyond all doubt

My dear father I observed I had no idea that the direction of the intention possessed the power of rendering promises null and void

You must perceive returned he what facility this affords for prosecuting the business of life But what has given us the most trouble has been to regulate the commerce between the sexes our fathers being more chary in the matter of

chastity Not but that they have discussed questions of a very curious and very indulgent character, particularly in reference to married and betrothed persons

At this stage of the conversation I was made acquainted with the most extraordinary questions you can well imagine He gave me enough of them to fill many letters, but, as you show my communications to all sorts of persons, and as I do not choose to be the vehicle of such reading to those who would make it the subject of diversion, I must decline even giving the quotations

The only thing to which I can venture to allude, out of all the books which he showed me, and these in French, too, is a passage which you will find in Father Bauny s *Summary*, p 165, relating to certain little familiarities, which, provided the intention is well directed, he explains *as passing for gallant* , and you will be surprised to find, on p 148, a principle of morals, as to the power which daughters have to dispose of their persons without the leave of their relatives, couched in these terms ' When that is done with the consent of the daughter, although the father may have reason to complain, it does not follow that she, or the person to whom she has sacrificed her honour, has done him any wrong, or violated the rules of justice in regard to him, for the daughter has possession of her honour, as well as of her body, and can do what she pleases with them, bating death or mutilation of her members Judge, from that specimen, of the rest It brings to my recollection a passage from a heathen poet, a much better casuist, it would appear, than these reverend doctors, for he says, ' that the person of a daughter does not belong wholly to herself, but partly to her father and partly to her mother, without whom she cannot dispose of it, even in marriage " And I am much mistaken if there is a single judge in the land who would not lay down as law the very reverse of this maxim of Father Bauny

This is all I dare tell you of this part of our conversation, which lasted so long that I was obliged to beseech the monk to change the subject He did so and proceeded to entertain me with their regulations about female attire

We shall not speak,' he said, of those who are actuated by impure intentions, but, as to others, Escobar remarks that if the woman adorn herself without any evil intention, but merely to gratify a natural inclination to vanity—*ob naturalem fastus inclinationem*—this is only a venial sin, or rather no sin at all And Father Bauny maintains, that even though the woman knows the bad effect which her care in adorning her person may have upon the virtue of those who may behold her, all decked out in rich and precious attire, she would not sin in so dressing And, among others, he cites our Father Sanchez as being of the same mind '

But, father, what do your authors say to those passages of Scripture which so strongly denounce everything of that sort?

'Lessius has well met that objection, said the monk, by observing that these passages of Scripture have the force of precepts only in regard to the women of that period, who were expected to exhibit, by their modest demeanour, an example of edification to the Pagans '"

' And where did he find that, father ?

' It does not matter where he found it," replied he, ' it is enough to know that the sentiments of these great men are always probable of themselves It deserves to be noticed however, that Father Le Moine has qualified this general permission, for he will on no account allow it to be extended to *the old ladies* Youth, he observes, is naturally entitled to adorn itself, nor can the use of ornament be con-

demned at an age which is the flower and verdure of life But there it should be allowed to remain it would be strangely out of season to seek for roses on the snow The stars alone have a right to be always dancing for they have the gift of perpetual youth The wisest course in this matter therefore for old women, would be to consult good sense and a good mirror to yield to decency and necessity, and to retire at the first approach of the shades of night

A most judicious advice I observed

But continued the monk just to show you how careful our fathers are about everything you can think of I may mention that after granting the ladies permission to gamble and foreseeing that in many cases this license would be of little avail unless they had something to gamble with they have established an other maxim in their favour which will be found in Escobar s chapter on larceny no 13 A wife says he may gamble and for this purpose may pilfer money from her husband

Well father that is capital!

There are many other good things besides that said the father but we must waive them and say a little about those more important maxims which facilitate the practice of holy things—the manner of attending mass for example On this subject our great divines Gaspard Hurtado and Coninck have taught that it is quite sufficient to be present at mass in body though we may be absent in spirit provided we maintain an outwardly respectful deportment Vasquez goes a step further maintaining that one fulfils the precept of hearing mass even though one should go with no such intention at all All this is repeatedly laid down by Escobar who in one passage illustrates the point by the example of those who are dragged to mass by force and who put on a fixed resolution not to listen to it

Truly sir said I had any other person told me that I would not have be lieved it

In good sooth he replied it requires all the support which the authority of these great names can lend it and so does the following maxim by the same Esco bar that even a wicked in ention such as that of ogling the women joined to that of hearing mass rightly does not hinder a man from fulfilling the service But another very convenient device suggested by our learned brother Turrian is that one may hear the half of a mass from one priest and the other half from an other and that it makes no difference though he should hear first the conclusion of the one and then the commencement of the other I might also mention that it has been decided by several of our doctors to be lawful to hear the two halves of a mass at the same time from the lips of two different priests one of whom is commencing the mass while the other is at the elevation it being quite possible to attend to both parties at once and two halves of a mass making a whole—*duae medietates un im missam constituunt* From all which says Escobar I conclude that you may hear mass in a very short period of time if for example you should happen to hear four masses going on at the same time so arranged that when the first is at the commencement the second is at the gospel the third at the conse cration and the last at the communion

Certainly father according to that plan one may hear mass any day at Notre Dame in a twinkling

Well replied he that just shows how admirably we have succeeded in facilitating the hearing of mass But I am anxious now to show you how we have

softened the use of the sacraments, and particularly that of penance It is here that the benignity of our fathers shines in its truest splendour, and you will be really astonished to find that devotion, a thing which the world is so much afraid of, should have been treated by our doctors with such consummate skill that, to use the words of Father Le Moine, in his *Devotion Made Easy*, demolishing the bugbear which the devil had placed at its threshold, they have rendered it easier than vice and more agreeable than pleasure, so that, in fact, simply to live is incomparably more irksome than to live well Is that not a marvellous change, now? '

' Indeed, father, I cannot help telling you a bit of my mind I am sadly afraid that you have overshot the mark, and that this indulgence of yours will shock more people than it will attract The mass, for example, is a thing so grand and so holy that, in the eyes of a great many, it would be enough to blast the credit of your doctors forever to show them how you have spoken of it '

' With a certain class, ' replied the monk, ' I allow that may be the case, but do you not know that we accommodate ourselves to all sorts of persons? You seem to have lost all recollection of what I have repeatedly told you on this point The first time you are at leisure, therefore, I propose that we make this the theme of our conversation, deferring till then the lenitives we have introduced into the confessional I promise to make you understand it so well that you will never forget it "

With these words we parted, so that our next conversation, I presume, will turn on the policy of the Society I am, &c

P S Since writing the above, I have seen *Paradise Opened by a Hundred Devotions Easily Practised*, by Father Barry, and also the *Mark of Predestination*, by Father Binet, both of them pieces well worth the seeing

LETTER X

Paris, *August* 2, 1656

SIR,

I have not come yet to the policy of the Society, but shall first introduce you to one of its leading principles I refer to the palliatives which they have applied to confession, and which are unquestionably the best of all the schemes they have fallen upon to attract all and repel none It is absolutely necessary to know something of this before going any further, and, accordingly, the monk judged it expedient to give me some instructions on the point, nearly as follows

' From what I have already stated, he observed, 'you may judge of the success with which our doctors have laboured to discover, in their wisdom, that a great many things, formerly regarded as forbidden, are innocent and allowable, but as there are some sins for which one can find no excuse, and for which there is no remedy but confession, it became necessary to alleviate, by the methods I am now going to mention, the difficulties attending that practice Thus, having shown you, in our previous conversations, how we relieve people from troublesome scruples of conscience by showing them that what they believed to be sinful was indeed quite innocent, I proceed now to illustrate our convenient plan for ex-

piating what is really sinful which is effected by making confession as easy a process as it was formerly a painful one

And how do you manage that father?

Why said he it is by those admirable subtleties which are peculiar to our Company and have been styled by our fathers in Flanders in *The Image of the First Century* the pious finesse the holy artifice of devotion—*piam et religiosam calliditatem et pietatis solertiam* By the aid of these inventions as they remark in the same place crimes may be expiated nowadays *alacrius*—with more zeal and alacrity than they were committed in former days and a great many people may be washed from their stains almost as cleverly as they contracted them—*plurimi vix citius maculas contrahunt quam eluunt*

Pray then father do teach me some of these most salutary lessons of *finesse*

We have a good number of them answered the monk for there are a great many irksome things about confession and for each of these we have devised a palliative The chief difficulties connected with this ordinance are the shame of confessing certain sins the trouble of specifying the circumstances of others the penance exacted for them the resolution against relapsing into them the avoidance of the proximate occasions of sins and the regret for having committed them I hope to convince you to day that it is now possible to get over all this with hardly any trouble at all such is the care we have taken to allay the bitterness and nauseousness of this very necessary medicine For to begin with the difficulty of confessing certain sins you are aware it is of importance often to keep in the good graces of one s confessor now must it not be extremely convenient to be permitted as you are by our doctors particularly Escobar and Suarez, to have two confessors one for the mortal sins and another for the venial in order to maintain a fair character with your ordinary confessor—*uti bonam famam apud ordinarium tueatur*—provided you do not take occasion from thence to indulge in mortal sin? This is followed by another ingenious contrivance for confessing a sin even to the ordinary confessor without his perceiving that it was committed since the last confession which is to make a general confession and huddle this last sin in a lump among the rest which we confess And I am sure you will own that the following decision of Father Bauny goes far to alleviate the shame which one must feel in confessing his relapses namely that except in certain cases which rarely occur the confessor is not entitled to ask his penitent if the sin of which he accuses himself is an habitual one nor is the latter obliged to answer such a question because the confessor ha no right to subject his penitent to the shame of disclosing his frequent relapses

Indeed father! I might as well say that a physician has no right to ask his patient if it is long since he had the fever Do not sins assume quite a different aspect according to circumstances? and should it not be the object of a genuine penitent to discover the whole state of his conscience to his confessor with the same sincerity and open heartedness as if he were speaking to Jesus Christ himself whose place the priest occupies? If so how far is he from realizing such a disposition who by concealing the frequency of his relapses conceals the aggravations of his offence!

I saw that this puzzled the worthy monk for he attempted to elude rather than resolve the difficulty by turning my attention to another of their rules which only goes to establish a fresh abuse instead of justifying in the least the decision

of Father Bauny, a decision which, in my opinion, is one of the most pernicious of their maxims, and calculated to encourage profligate men to continue in their evil habits

I grant you," replied the father, "that habit aggravates the malignity of a sin, but it does not alter its nature, and that is the reason why we do not insist on people confessing it, according to the rule laid down by our fathers, and quoted by Escobar, that one is only obliged to confess the circumstances that alter the species of the sin, and not those that aggravate it ' Proceeding on this rule, Father Granados says, that if one has eaten flesh in Lent, all he needs to do is to confess that he has broken the fast, without specifying whether it was by eating flesh, or by taking two fish meals ' And, according to Reginald, 'a sorcerer who has employed the diabolical art is not obliged to reveal that circumstance, it is enough to say that he has dealt in magic, without expressing whether it was by palmistry or by a paction with the devil ' Fagundez, again, has decided that rape is not a circumstance which one is bound to reveal, if the woman give her consent All this is quoted by Escobar, with many other very curious decisions as to these circumstances, which you may consult at your leisure "

'These 'artifices of devotion' are vastly convenient in their way," I observed

"And yet," said the father, notwithstanding all that, they would go for nothing, sir, unless we had proceeded to mollify penance, which, more than anything else, deters people from confession Now, however, the most squeamish have nothing to dread from it, after what we have advanced in our theses of the College of Clermont, where we hold that, if the confessor imposes a suitable penance, and the penitent be unwilling to submit himself to it, the latter may go home, 'waiving both the penance and the absolution ' Or, as Escobar says, in giving the Practice of our Society, 'if the penitent declare his willingness to have his penance remitted to the next world, and to suffer in purgatory all the pains due to him, the confessor may, for the honour of the sacrament, impose a very light penance on him, particularly if he has reason to believe that this penitent would object to a heavier one ' "

I really think," said I, 'that, if that is the case, we ought no longer to call confession the *sacrament of penance*

You are wrong, he replied, ' for we always administer something in the way of penance, for the form s sake

' But, father, do you suppose that a man is worthy of receiving absolution when he will submit to nothing painful to expiate his offences? And, in these circumstances, ought you not to retain rather than remit their sins? Are you not aware of the extent of your ministry, and that you have the power of binding and loosing? Do you imagine that you are at liberty to give absolution indifferently to all who ask it, and without ascertaining beforehand if Jesus Christ looses in heaven those whom you loose on earth?

'What!" cried the father, do you suppose that we do not know that the confessor (as one remarks) ought to sit in judgement on the disposition of his penitent, both because he is bound not to dispense the sacraments to the unworthy, Jesus Christ having enjoined him to be a faithful steward and not give that which is holy unto dogs, and because he is a judge and it is the duty of a judge to give righteous judgement, by loosing the worthy and binding the unworthy, and he ought not to absolve those whom Jesus Christ condemns ' '

Whose words are these father?

They are the words of our father Filiutius he replied

You astonish me said I I took them to be a quotation from one of the fathers of the Church At all events sir that passage ought to make an impression on the confessors and render them very circumspect in the dispensation of this sacrament to ascertain whether the regret of their penitents is sufficient and whether their promises of future amendment are worthy of credit

That is not such a difficult matter replied the father Filiutius had more sense than to leave confessors in that dilemma and accordingly he suggests an easy way of getting out of it in the words immediately following 'The confessor may easily set his mind at rest as to the disposition of his penitent for if he fail to give sufficient evidence of sorrow the confessor has only to ask him if he does not detest the sin in his heart and if he answers that he does he is bound to believe it The same thing may be said of resolutions as to the future unless the case involves an obligation to restitution or to avoid some proximate occasion of sin

As to that passage father I can easily believe that it is Filiutius own

You are mistaken though said the father for he has extracted it word for word from Suarez

But father that last passage from Filiutius overturns what he had laid down in the former For confessors can no longer be said to sit as judges on the disposition of their penitents if they are bound to take it simply upon their word in the absence of all satisfying signs of contrition Are the professions made on such occasions so infallible that no other sign is needed? I question much if experience has taught your fathers that all who make fair promises are remarkable for keeping them I am mistaken if they have not often found the reverse

No matter replied the monk confessors are bound to believe them for all that for Father Bauny who has probed this question to the bottom has concluded that at whatever time those who have fallen into frequent relapses without giving evidence of amendment present themselves before a confessor expressing their regret for the past and a good purpose for the future he is bound to believe them on their simple averment although there may be reason to presume that such resolution only came from the teeth outwards Nay says he, though they should indulge subsequently to greater excess than ever in the same delinquencies still in my opinion they may receive absolution There now! that I am sure should silence you

But father said I you impose a great hardship I think on the confessors by thus obliging them to believe the very reverse of what they see

You don t understand it returned he all that is meant is that they are obliged to act and absolve *as if* they believed that their penitents would be true to their engagements though in point of fact they believe no such thing This *is explained immediately afterwards* by Suarez and Filiutius After having said that the priest is bound to believe the penitent on his word they add *It is not necessary that the confessor should be convinced that the good resolution of his penitent will be carried into effect nor even that he should judge it probable it is enough that he thinks the person has at the time the design in general though he may very shortly after relapse Such is the doctrine of all our authors—ita*

docent omnes autores' Will you presume to doubt what has been taught by our authors?

'But, sir, what then becomes of what Father Petau himself is obliged to own, in the preface to his *Public Penance*, that the holy fathers, doctors, and councils of the Church agree in holding it as a settled point that the penance preparatory to the eucharist must be genuine, constant, resolute, and not languid and sluggish, or subject to after thoughts and relapses?

"Don't you observe," replied the monk, that Father Petau is speaking of the *ancient Church?* But all that is now *so little in season*, to use a common saying of our doctors, that, according to Father Bauny, the reverse is the only true view of the matter There are some,' says he, who maintain that absolution ought to be re fused to those who fall frequently into the same sin, more especially if, after being often absolved, they evince no signs of amendment, and others hold the opposite view But the only true opinion is that they ought not to be refused absolution, and, though they should be nothing the better of all the advice given them, though they should have broken all their promises to lead new lives, and been at no trouble to purify themselves, still it is of no consequence, whatever may be said to the contrary, the true opinion which ought to be followed is that even in all these cases, they ought to be absolved ' And again Absolution ought neither to be denied nor delayed in the case of those who live in habitual sins against the law of God, of nature, and of the Church, although there should be no apparent prospect of future amendment—*etsi emendationis futuræ nulla spes appareat*'"

"But, father, this certainty of always getting absolution may induce sinners—"

I know what you mean," interrupted the Jesuit, but listen to Father Bauny, Q 15 Absolution may be given even to him who candidly avows that the hope of being absolved induced him to sin with more freedom than he would otherwise have done ' And Father Caussin, defending this proposition, says that, were this not true, confession would be interdicted to the greater part of mankind, and the only resource left poor sinners would be a branch and a rope

O father, how these maxims of yours will draw people to your confessionals!

Yes, he replied, you would hardly believe what numbers are in the habit of frequenting them, we are absolutely oppressed and overwhelmed, so to speak, under the crowd of our penitents—*penitentium numero obruimur* —as is said in *The Image of the First Century*

'I could suggest a very simple method, said I, to escape from this inconvenient pressure You have only to oblige sinners to avoid the proximate occasions of sin, that single expedient would afford you relief at once

We have no wish for such a relief rejoined the monk, quite the reverse, for, as is observed in the same book, the great end of our Society is to labor to establish the virtues, to wage war on the vices, and to save a great number of souls Now, as there are very few souls inclined to quit the proximate occasions of sin, we have been obliged to define what a proximate occasion is That cannot be called a proximate occasion, says Escobar, where one sins but rarely, or on a sudden transport—say three or four times a year , or, as Father Bauny has it, 'once or twice in a month Again, asks this author, what is to be done in the case of masters and servants, or cousins, who, living under the same roof, are by this occasion tempted to sin?

They ought to be separated, said I

That is what he says too if their relapses be very frequent but if the parties offend rarely and cannot be separated without trouble and loss they may according to Suarez and other authors be absolved provided they promise to sin no more and are truly sorry for what is past

This required no explanation for he had already informed me with what sort of evidence of contrition the confessor was bound to rest satisfied

And Father Bauny continued the monk permits those who are involved in the proximate occasions of sin to remain as they are when they cannot avoid them without becoming the common talk of the world or subjecting themselves to inconvenience A priest he remarks in another work may and ought to absolve a woman who is guilty of living with a paramour if she cannot put him away honourably or has some reason for keeping him—*si non potest honeste ejicere aut habeat aliquam causam retinendi*—provided she promises to act more virtuously for the future

Well father cried I you have certainly succeeded in relaxing the obligation of avoiding the occasions of sin to a very comfortable extent by dispensing with the duty as soon as it becomes inconvenient but I should think your fathers will at least allow it be binding when there is no difficulty in the way of its performance?

Yes said the father though even then the rule is not without exceptions For Father Bauny says in the same place that any one may frequent profligate houses with the view of converting their unfortunate inmates though the probability should be that he fall into sin having often experienced before that he has yielded to their fascinations Some doctors do not approve of this opinion and hold that no man may voluntarily put his salvation in peril to succour his neighbor yet I decidedly embrace the opinion which they controvert

A novel sort of preachers these father! But where does Father Bauny find any ground for investing them with such a mission?

It is upon one of his own principles he replied which he announces in the same place after Basil Ponce I mentioned it to you before and I presume you have not forgotten it It is that one may seek an occasion of sin directly and expressly—*primo et per se*—to promote the temporal or spiritual good of himself or his neighbour

On hearing these passages I felt so horrified that I was on the point of breaking out but being resolved to hear him to an end I restrained myself and merely inquired How father does this doctrine comport with that of the Gospel which binds us to pluck out the right eye and cut off the right hand when they offend or prove prejudicial to salvation? And how can you suppose that the man who wilfully indulges in the occasions of sins sincerely hates sin? Is it not evident on the contrary that he has never been properly touched with a sense of it and that he has not yet experienced that genuine conversion of heart, which makes a man love God as much as he formerly loved the creature?

Indeed! cried he do you call that genuine contrition? It seems you do not know that as Father Pintereau says all our fathers teach with one accord that it is an error and almost a heresy to hold that *contrition* is necessary or that *attrition* alone induced by the *sole* motive the fear of the pains of hell which excludes a disposition to offend is not sufficient with the sacrament?

"What, father! do you mean to say that it is almost an article of faith that attrition, induced merely by fear of punishment, is sufficient with the sacrament? That idea, I think, is peculiar to your fathers, for those other doctors who hold that attrition is sufficient along with the sacrament, always take care to show that it must be accompanied with some love to God at least It appears to me, moreover, that even your own authors did not always consider this doctrine of yours so certain Your Father Suarez, for instance, speaks of it thus Although it is a probable opinion that attrition is sufficient with the sacrament, yet it is not certain, and it may be false—*non est certa, et potest esse falsa* And, if it is false, attrition is not sufficient to save a man, and he that dies knowingly in this state, wilfully exposes himself to the grave peril of eternal damnation For this opinion is neither very ancient nor very common—*nec valde antiqua, nec multum communis* Sanchez was not more prepared to hold it as infallible when he said in his *Summary* that the sick man and his confessor, who content themselves at the hour of death with attrition and the sacrament, are both chargeable with mortal sin, on account of the great risk of damnation to which the penitent would be exposed, if the opinion that attrition is sufficient with the sacrament should not turn out to be true' Comitolus, too, says that we should not be too sure that attrition suffices with the sacrament

Here the worthy father interrupted me 'What!" he cried, you read our authors then, it seems? That is all very well, but it would be still better were you never to read them without the precaution of having one of *us* beside you Do you not see, now, that, from having read them alone, you have concluded, in your simplicity, that these passages bear hard on those who have more lately supported our doctrine of attrition? Whereas it might be shown that nothing could set them off to greater advantage Only think what a triumph it is for our fathers of the present day to have succeeded in disseminating their opinion in such short time, and to such an extent that, with the exception of theologians, nobody almost would ever suppose but that our modern views on this subject had been the uniform belief of the faithful in all ages! So that, in fact, when you have shown, from our fathers themselves, that, a few years ago, this opinion was not certain,' you have only succeeded in giving our modern authors the whole merit of its establishment!

Accordingly, he continued,' our cordial friend Diana, to gratify us, no doubt, has recounted the various steps by which the opinion reached its present position In former days, the ancient schoolmen maintained that contrition was necessary as soon as one had committed a mortal sin, since then, however, it has been thought that it is not binding except on festival days, afterwards only when some great calamity threatened the people, others, again, that it ought not to be long delayed at the approach of death But our fathers, Hurtado and Vasquez, have ably refuted all these opinions and established that one is not bound to contrition unless he cannot be absolved in any other way, or at the point of death! But, to continue the wonderful progress of this doctrine, I might add, what our fathers, Fagundez, Granados, and Escobar, have decided, that contrition is not necessary even at death, because say they, if attrition with the sacrament did not suffice at death, it would follow that attrition would not be sufficient with the sacrament And the learned Hurtado, cited by Diana and Escobar,

goes still further for he asks Is that sorrow for sin which flows solely from apprehension of its temporal consequences such as having lost health or money sufficient? We must distinguish If the evil is not regarded as sent by the hand of God such a sorrow does not suffice but if the evil is viewed as sent by God as in fact all evil says Diana except sin comes from him that kind of sorrow is sufficient Our Father Lamy holds the same doctrine

You surprise me father for I see nothing in all that attrition of which you speak but what is natural and in this way a sinner may render himself worthy of absolution without supernatural grace at all Now everybody knows that this is a heresy condemned by the Council

I should have thought with you he replied and yet it seems this must not be the case for the fathers of our College of Clermont have maintained (in their Theses of the 23rd May and 6th June 1644) that attrition may be holy and sufficient for the sacrament although it may not be supernatural and (in that of August 1643) that attrition though merely natural is sufficient for the sacrament provided it is honest I do not see what more could be said on the subject unless we choose to subjoin an inference which may be easily drawn from these principles namely that contrition so far from being necessary to the sacrament is rather prejudicial to it inasmuch as by washing away sins of itself it would leave nothing for the sacrament to do at all That is indeed exactly what the celebrated Jesuit Father Valencia remarks (Book iv disp 7 q 8 p 4) Contrition says he is by no means necessary in order to obtain the principal benefit of the sacrament on the contrary it is rather an obstacle in the way of it—*imo obstat potius quominus effectus sequatur* Nobody could well desire more to be said in commendation of attrition

I believe that father said I but you must allow me to tell you my opinion and to show you to what a dreadful length this doctrine leads When you say that attrition induced by the mere dread of punishment is sufficient with the sacrament to justify sinners does it not follow that a person may always expiate his sins in this way and thus be saved without ever having loved God all his lifetime? Would your fathers venture to hold that?

I perceive replied the monk from the strain of your remarks that you need some information on the doctrine of our fathers regarding the love of God This is the last feature of their morality and the most important of all You must have learned something of it from the passages about contrition which I have quoted to you But here are others still more definite on the point of love to God—Don t interrupt me now for it is of importance to notice the connection Attend to Escobar who reports the different opinions of our authors in his *Practice of the Love of God according to our Society* The question is When is one obliged to have an actual affection for God? Suarez says it is enough if one loves Him before being *articulo mortis*—at the point of death—without determining the exact time Vasquez that it is sufficient even at the very point of death Others when one has received baptism Others again when one is bound to exercise contrition And others on festival days But our father Castro Palao, combats all these opinions and with good reason—*merito* Hurtado de Mendoza insists that we are obliged to love God once a year and that we ought to regard it as a great favour that we are not bound to do it oftener But our Father Coninck

thinks that we are bound to it only once in three or four years, Henriquez, once in five years, and Filiutius says that it is *probable* that we are not strictly bound to it even once in five years How often, then, do you ask? Why, he refers it to the judgement of the judicious '

I took no notice of all this badinage, in which the ingenuity of man seems to be *sporting, in the height of insolence, with the love of God*

' But," pursued the monk, our Father Antony Sirmond surpasses all on this point, in his admirable book, *The Defence of Virtue*, where, as he tells the reader, he speaks French in France, as follows St Thomas says that we are obliged to love God as soon as we come to the use of reason that is rather too soon! Scotus says every Sunday, pray, for what reason? Others say when we are sorely tempted yes, if there be no other way of escaping the temptation Scotus says when we have received a benefit from God good, in the way of thanking Him for it Others say at death rather late! As little do I think it binding at the reception of any sacrament attrition in such cases is quite enough, along with confession, if convenient Suarez says that it is binding at some time or another, but at what time?—he leaves you to judge of that for yourself—he does not know, and what that doctor did not know I know not who should know In short, he concludes that we are not strictly bound to more than to keep the other commandments, without any affection for God, and without giving Him our hearts, provided that we do not hate Him To prove this is the sole object of his second treatise You will find it in every page, more especially where he says God, in commanding us to love Him, is satisfied with our obeying Him in his other commandments If God had said Whatever obedience thou yieldest me, if thy heart is not given to me, I will destroy thee!" would such a motive, think you, be well fitted to promote the end which God must, and only can, have in view? Hence it is said that we shall love God by doing His will, *as if* we loved Him with affection, as if the motive in this case was real charity If that is really our motive, so much the better, if not, still we are strictly fulfilling the commandment of love, by having its works, so that (such is the goodness of God!) we are commanded, not so much to love Him, as not to hate Him

"Such is the way in which our doctors have discharged men from the *painful* obligation of actually loving God And this doctrine is so advantageous that our Fathers Annat, Pintereau, Le Moine, and Antony Sirmond himself, have strenuously defended it when it has been attacked You have only to consult their answers to the *Moral Theology* That of Father Pintereau, in particular, will enable you to form some idea of the value of this dispensation, from the price which he tells us that it cost, which is no less than the blood of Jesus Christ This crowns the whole It appears, that this dispensation from the *painful* obligation to love God, is the privilege of the Evangelical law, in opposition to the Judaical It was reasonable,' he says, 'that, under the law of grace in the New Testament, God should relieve us from that troublesome and arduous obligation which existed under the law of bondage, to exercise an act of perfect contrition in order to be justified, and that the place of this should be supplied by the sacraments, instituted in aid of an easier disposition Otherwise, indeed, Christians, who are the children, would have no greater facility in gaining the good graces of their Father than the Jews, who were the slaves, had *in obtaining the mercy* of their Lord and Master

O father! cried I no patience can stand this any longer It is impossible to listen without horror to the sentiments I have just heard

They are not my sentiments said the monk

I grant it sir said I but you feel no aversion to them and so far from detesting the authors of these maxims you hold them in esteem Are you not afraid that your consent may involve you in a participation of their guilt? and are you not aware that St Paul judges worthy of death not only the authors of evil things but also those who have pleasure in them that do them? Was it not enough to have permitted men to indulge in so many forbidden things under the covert of your palliations? Was it necessary to go still further and hold out a bribe to them to commit even those crimes which you found it impossible to excuse by offering them an easy and certain absolution and for this purpose nullifying the power of the priests and obliging them more as slaves than as judges to absolve the most inveterate sinners—without any amendment of life without any sign of contrition except promises a hundred times broken without penance unless they choose to accept of it and without abandoning the occasions of their vices if they should thereby be put to any inconvenience?

But your doctors have gone even beyond this and the license which they have assumed to tamper with the most holy rules of Christian conduct amounts to a total subversion of the law of God They violate the great commandment on which hang all the law and the prophets they strike at the very heart of piety they rob it of the spirit that giveth life they hold that to love God is not necessary to salvation and go so far as to maintain that this dispensation from loving God is the privilege which Jesus Christ has introduced into the world! This sir is the very climax of impiety The price of the blood of Jesus Christ paid to obtain us a dispensation from loving Him! Before the incarnation it seems men were obliged to love God but since God has so loved the world as to give His only begotten Son the world redeemed by him is released from loving Him! Strange divinity of our days—to dare to take off the anathema which St Paul denounces on those that love not the Lord Jesus! To cancel the sentence of St John He that loveth not abideth in death! and that of Jesus Christ himself He that loveth me not keepeth not my precepts! and thus to render those worthy of enjoying God through eternity who never loved God all their life! Behold the Mystery of Iniquity fulfilled! Open your eyes at length my dear father and if the other aberrations of your casuists have made no impression on you let these last by their very extravagance compel you to abandon them This is what I desire from the bottom of my heart for your own sake and for the sake of your doctors and my prayer to God is that He would vouchsafe to convince them how false the light must be that has guided them to such precipices and that He would fill their hearts with that love of Himself from which they have dared to give man a dispensation!

After some remarks of this nature I took my leave of the monk and I see no great likelihood of my repeating my visits to him This however need not occasion you any regret for should it be necessary to continue these communications on their maxims I have studied their books sufficiently to tell you as much of their morality and more perhaps of their policy than he could have done himself I am &c.

LETTER XI

TO THE REVEREND FATHERS, THE JESUITS

August 18, 1656

REVEREND FATHERS,

I have seen the letters which you are circulating in opposition to those which I wrote to one of my friends on your morality, and I perceive that one of the principal points of your defence is that I have not spoken of your maxims with sufficient seriousness This charge you repeat in all your productions, and carry it so far as to allege, that I have been "guilty of turning sacred things into ridicule

Such a charge, fathers, is no less surprising than it is unfounded Where do you find that I have turned sacred things into ridicule? You specify ' the Mohatra contract, and the story of John d Alba But are these what you call sacred things? Does it really appear to you that the Mohatra is something so venerable that it would be blasphemy not to speak of it with respect? And the lessons of Father Bauny on larceny, which led John d Alba to practise it at your expense, are they so sacred as to entitle you to stigmatize all who laugh at them as profane people?

What, fathers! must the vagaries of your doctors pass for the verities of the Christian faith, and no man be allowed to ridicule Escobar, or the fantastical and unchristian dogmas of your authors, without being stigmatized as jesting at religion? Is it possible you can have ventured to reiterate so often an idea so utterly unreasonable? Have you no fears that, in blaming me for laughing at your absurdities, you may only afford me fresh subject of merriment, that you may make the charge recoil on yourselves, by showing that I have really selected nothing from your writings as the matter of raillery but what was truly ridiculous, and that thus, in making a jest of your morality, I have been as far from jeering at holy things, as the doctrine of your casuists is far from being the holy doctrine of the Gospel?

Indeed, reverend sirs, there is a vast difference between laughing at religion and laughing at those who profane it by their extravagant opinions It were impiety to be wanting in respect for the verities which the Spirit of God has revealed, but it were no less impiety of another sort to be wanting in contempt for the falsities which the spirit of man opposes to them

For, fathers (since you will force me into this argument), I beseech you to consider that, just in proportion as Christian truths are worthy of love and respect, the contrary errors must deserve hatred and contempt, there being two things in the truths of our religion a divine beauty that renders them lovely, and a sacred majesty that renders them venerable, and two things also about errors an impiety, that makes them horrible, and an impertinence that renders them ridiculous For these reasons, while the saints have ever cherished towards the truth the twofold sentiment of love and fear—the whole of their wisdom being comprised between fear, which is its beginning, and love, which is its end—they have, at the same time, entertained towards error the twofold feeling of hatred and contempt, and their zeal has been at once employed to repel, by force of

"O father," cried I, "no patience can stand this any longer. It is impossible to listen without horror to the sentiments I have just heard."

"They are not my sentiments," said the monk.

"I grant it, sir," said I, "but you feel no aversion to them; and, so far from detesting the authors of these maxims, you hold them in esteem. Are you not afraid that your consent may involve you in a participation of their guilt? and are you not aware that St. Paul judges worthy of death, not only the authors of evil things, but also 'those who have pleasure in them that do them'? Was it not enough to have permitted men to indulge in so many forbidden things under the cover of your palliations? Was it necessary to go still further and hold out a bribe to them to commit even those crimes which you found it impossible to excuse, by offering them an easy and certain absolution; and for this purpose nullifying the power of the priests, and obliging them, more as slaves than as judges, to absolve the most inveterate sinners—without any amendment of life, without any sign of contrition except promises a hundred times broken, without penance 'unless they choose to accept of it,' and without abandoning the occasions of their vices 'if they should thereby be put to any inconvenience'?

"But your doctors have gone even beyond this; and the license which they have assumed to tamper with the most holy rules of Christian conduct amounts to a total subversion of the law of God. They violate 'the great commandment on which hang all the law and the prophets'; they strike at the very heart of piety; they rob it of the spirit that giveth life; they hold that to love God is not necessary to salvation; and go so far as to maintain that 'this dispensation from loving God is the privilege which Jesus Christ has introduced into the world'! This, sir, is the very climax of impiety. The price of the blood of Jesus Christ paid to obtain us a dispensation from loving Him! Before the incarnation, it seems men were obliged to love God; but since 'God has so loved the world as to give His only begotten Son,' the world, redeemed by him, is released from loving Him! Strange divinity of our days—to dare to take off the 'anathema' which St. Paul denounces on those 'that love not the Lord Jesus'! To cancel the sentence of St. John: 'He that loveth not, abideth in death'; and that of Jesus Christ himself: 'He that loveth me not keepeth not my precepts!' and thus to render those worthy of enjoying God through eternity who never loved God all their life! Behold the Mystery of Iniquity fulfilled! Open your eyes at length, my dear father, and if the other aberrations of your casuists have made no impression on you, let these last, by their very extravagance, compel you to abandon them. This is what I desire from the bottom of my heart, for your own sake and for the sake of your doctors; and my prayer to God is that He would vouchsafe to convince them how false the light must be that has guided them to such precipices; and that He would fill their hearts with that love of Himself from which they have dared to give man a dispensation!"

After some remarks of this nature, I took my leave of the monk, and I see no great likelihood of my repeating my visits to him. This, however, need not occasion you any regret; for, should it be necessary to continue these communications on their maxims, I have studied their books sufficiently to tell you as much of their morality, and more, perhaps, of their policy, than he could have done himself. I am, &c.

persons who enact the part of 'masters' among Christians, as Nicodemus and the Pharisees did among the Jews, show themselves so ignorant of the first principles of religion as to maintain, for example, that 'a man may be saved who never loved God all his life,' we only follow the example of Jesus Christ when we laugh at such a combination of ignorance and conceit

I am sure, fathers, these sacred examples are sufficient to convince you that to deride the errors and extravagances of man is not inconsistent with the practice of the saints, otherwise we must blame that of the greatest doctors of the Church, who have been guilty of it—such as St Jerome, in his letters and writings against Jovinian, Vigilantius, and the Pelagians, Tertullian, in his *Apology* against the follies of idolaters, St Augustine against the monks of Africa, whom he styles 'the hairy men', St Irenæus the Gnostics, St Bernard and the other fathers of the Church, who, having been the imitators of the apostles, ought to be imitated by the faithful in all time coming, for, say what we will, they are the true models for Christians, even of the present day

In following such examples, I conceived that I could not go far wrong, and, as I think I have sufficiently established this position, I shall only add, in the admirable words of Tertullian, which give the true explanation of the whole of my proceeding in this matter 'What I have now done is only a little sport before the real combat I have rather indicated the wounds that might be given you than inflicted any If the reader has met with passages which have excited his risibility, he must ascribe this to the subjects themselves There are many things which deserve to be held up in this way to ridicule and mockery, lest, by a serious refutation, we should attach a weight to them which they do not deserve Nothing is more due to vanity than laughter, and it is the Truth properly that has a right to laugh, because she is cheerful, and to make sport of her enemies, because she is sure of the victory Care must be taken, indeed, that the raillery is not too low, and unworthy of the truth, but, keeping this in view, when ridicule may be employed with effect, it is a duty to avail ourselves of it' Do you not think fathers, that this passage is singularly applicable to our subject? The letters which I have hitherto written are 'merely a little sport before a real combat' As yet, I have been only playing with the foils and 'rather indicating the wounds that might be given you than inflicting any' I have merely exposed your passages to the light, without making scarcely a reflection on them 'If the reader has met with any that have excited his risibility, he must ascribe this to the subjects themselves' And, indeed, what is more fitted to raise a laugh than to see a matter so grave as that of Christian morality decked out with fancies so grotesque as those in which you have exhibited it? One is apt to form such high anticipations of these maxims, from being told that 'Jesus Christ himself has revealed them to the fathers of the Society', that when one discovers among them such absurdities as '*that a priest, receiving money to say a mass, may take additional sums from other persons by giving up to them his own share in the sacrifice*', 'that a monk is not to be excommunicated for putting off his habit, provided it is to dance, swindle, or go incognito into infamous houses', and 'that the duty of hearing mass may be fulfilled by listening to four quarters of a mass at once from different priests'—when, I say, one listens to such decisions as these, the surprise is such that it is impossible to refrain from laughing, for nothing is more calculated to produce that emotion than a startling contrast between the thing looked for and

the thing looked at And why should the greater part of these maxims be treated in any other way? As Tertullian says To treat them seriously would be to sanction them

What! is it necessary to bring up all the forces of Scripture and tradition in order to prove that running a sword through a man s body covertly and behind his back is to murder him in treachery? or that to give one money as a motive to resign a benefice is to purchase the benefice? Yes there are things which it is duty to despise and which deserve only to be laughed at In short the remark of that ancient author that nothing is more due to vanity than derision with what follows applies to the case before us so justly and so convincingly as to put it beyond all question that we may laugh at errors without violating propriety

And let me add fathers that this may be done without any breach of charity either though this is another of the charges you bring against me in your publications For according to St Augustine charity may sometimes oblige us to ridicule the errors of men that they may be induced to laugh at them in their turn and renounce them—*Hæc tu misericorditer irride ut eis ridenda ac fugienda commendes* And the same charity may also at other times bind us to repel them with indignation according to that other saying of St Gregory of Nazianzen The spirit of meekness and charity hath its emotions and its heats Indeed as St Augustine observes who would venture to say that truth ought to stand disarmed against falsehood or that the enemies of the faith shall be at liberty to frighten the faithful with hard words and jeer at them with lively sallies of wit while the Catholics ought never to write except with a coldness of style enough to set the reader asleep?

Is it not obvious that by following such a course a wide door would be opened for the introduction of the most extravagant and pernicious dogmas into the Church while none would be allowed to treat them with contempt through fear of being charged with violating propriety or to confute them with indignation from the dread of being taxed with want of charity?

Indeed fathers! shall you be allowed to maintain that it is lawful to kill a man to avoid a box on the ear or an affront and must nobody be permitted publicly to expose a public error of such consequence? Shall you be at liberty to say that a judge may in conscience retain a fee received for an act of injustice and shall no one be at liberty to contradict you? Shall you print with the privilege and approbation of your doctors that a man may be saved without ever having loved God and will you shut the mouth of those who defend the *true faith* by telling them that they would violate brotherly love by attacking you and Christian modesty by laughing at your maxims? I doubt fathers if there be any persons whom you could make believe this if however there be any such who are really persuaded that by denouncing your morality I have been deficient in the charity which I owe to you I would have them examine with great jealousy, whence this feeling takes its rise within them They may imagine that it proceeds from a holy zeal which will not allow them to see their neighbour impeached without being scandalized at it but I would entreat them to consider that it is *not impossible* that it may flow from another source and that it is even extremely likely that it may spring from that secret and often self concealed dissatisfaction which the unhappy corruption within us seldom fails to stir up against those who oppose the relaxation of morals And to furnish them with a rule which may

enable them to ascertain the real principle from which it proceeds, I will ask them if, while they lament the way in which the religious have been treated, they lament still more the manner in which these religious have treated the truth, if they are incensed, not only against the letters, but still more against the maxims quoted in them. I shall grant it to be barely possible that their resentment proceeds from some zeal, though not of the most enlightened kind, and, in this case, the passages I have just cited from the fathers will serve to enlighten them. But if they are merely angry at the reprehension, and not at the things reprehended, truly, fathers, I shall never scruple to tell them that they are grossly mistaken, and that their zeal is miserably blind.

Strange zeal, indeed! which gets angry at those that censure public faults, and not at those that commit them! Novel charity this, which groans at seeing error confuted, but feels no grief at seeing morality subverted by that error. If these persons were in danger of being assassinated, pray, would they be offended at one advertising them of the stratagem that had been laid for them, and instead of turning out of their way to avoid it, would they trifle away their time in whining about the little charity manifested in discovering to them the criminal design of the assassins? Do they get waspish when one tells them not to eat such an article of food, because it is poisoned? or not to enter such a city, because it has the plague?

Whence comes it, then, that the same persons who set down a man as wanting in charity, for exposing maxims hurtful to religion, would, on the contrary, think him equally deficient in that grace were he not to disclose matters hurtful to health and life, unless it be from this, that their fondness for life induces them to take in good part every hint that contributes to its preservation, while their indifference to truth leads them, not only to take no share in its defence, but even to view with pain the efforts made for the extirpation of falsehood?

Let them seriously ponder, as in the sight of God, how shameful, and how prejudicial to the Church, is the morality which your casuists are in the habit of propagating, the scandalous and unmeasured license which they are introducing into public manners, the obstinate and violent hardihood with which you support them. And if they do not think it full time to rise against such disorders, their blindness is as much to be pitied as yours, fathers, and you and they have equal reason to dread that saying of St. Augustine, founded on the words of Jesus Christ, in the Gospel: "Woe to the blind leaders! woe to the blind followers!"—*Væ cæcis ducentibus! væ cæcis sequentibus!*

But, to leave you no room in future, either to create such impressions on the minds of others, or to harbour them in your own, I shall tell you, fathers (and I am ashamed I should have to teach you what I should have rather learnt from you), the marks which the fathers of the Church have given for judging when our animadversions flow from a principle of piety and charity, and when from a spirit of malice and impiety.

The first of these rules is that the spirit of piety always prompts us to speak with sincerity and truthfulness, whereas malice and envy make use of falsehood and calumny. *Splendentia et vehementia, sed rebus vera*—"Splendid and vehement in words, but true in things," as St. Augustine says. The dealer in falsehood is an agent of the devil. No direction of the intention can sanctify slander, and though the conversion of the whole earth should depend on it, no man may warrantably

calumniate the innocent because none may do the least evil in order to accomplish the greatest good and as the Scripture says the truth of God stands in no need of our lie St Hilary observes that it is the bounden duty of the advocates of truth to advance nothing in its support but true things Now fathers I can declare before God that there is nothing that I detest more than the slightest possible deviation from the truth and that I have ever taken the greatest care not only not to falsify (which would be horrible) but not to alter or wrest *in the* slightest possible degree the sense of a single passage So closely have I adhered to this rule that if I may presume to apply them to the present case I may safely say in the words of the same St Hilary If we advance things that are false let our statements be branded with infamy but if we can show that they are public and notorious it is no breach of apostolic modesty or liberty to expose them

It is not enough however to tell nothing but the truth we must not always tell everything that is true we should publish only those things which it is useful to disclose and not those which can only hurt without doing any good And therefore as the first rule is to speak with truth the second is to speak with discretion The wicked says St Augustine in persecuting the good blindly follow the dictates of their passion but the good in their prosecution of the wicked are guided by a wise *discretion even as the surgeon warily considers* where he is cutting while the murderer cares not where he strikes You must be sensible fathers that in selecting from the maxims of your authors I have refrained from quoting those which would have galled you most though I might have done it and that without sinning against discretion as others who were both learned and Catholic writers have done before me All who have read your authors know how far I have spared you in this respect Besides I have taken no notice whatever of what might be brought against individual characters among you and I would have been extremely sorry to have said a word about secret and personal failings whatever evidence I might have of them being persuaded that this is the distinguishing property of malice and a practice which ought never to be resorted to unless where it is urgently demanded for the good of the Church *It is obvious therefore that in what I have been compelled to advance against* your moral maxims I have been by no means wanting in due consideration and that you have more reason to congratulate yourself on my moderation than to complain of my indiscretion

The third rule fathers is That when there is need to employ a little raillery the spirit of piety will take care to employ it against error only and not against things holy whereas the spirit of buffoonery impiety and heresy mocks at all that is most sacred I have already vindicated myself on that score and indeed there is no great danger of falling into that vice so long as I confine my remarks to the opinions which I have quoted from your authors

In short fathers to abridge these rules I shall only mention another which is the essence and the end of all the rest That the spirit of charity prompts us to cherish in the heart a desire for the salvation of those against whom we dispute and to address our prayers to God while we direct our accusations to men We ought ever says St Augustine to preserve charity in the heart even while we are obliged to pursue a line of external conduct which to man has the appearance of harshness we ought to smite them with a sharpness severe but kindly remembering that their advantage is more to be studied than their gratification I

am sure, fathers, that there is nothing in my letters from which it can be inferred that I have not cherished such a desire towards you, and as you can find nothing to the contrary in them, charity obliges you to believe that I have been really actuated by it. It appears, then, that you cannot prove that I have offended against this rule, or against any of the other rules which charity inculcates, and you have no right to say, therefore, that I have violated it.

But, fathers, if you should now like to have the pleasure of seeing, within a short compass, a course of conduct directly at variance with each of these rules, and bearing the genuine stamp of the spirit of buffoonery, envy, and hatred, I shall give you a few examples of it, and, that they may be of the sort best known and most familiar to you, I shall extract them from your own writings.

To begin, then, with the unworthy manner in which your authors speak of holy things, whether in their sportive and gallant effusions, or in their more serious pieces, do you think that the parcel of ridiculous stories, which your father Binet has introduced into his *Consolation to the Sick*, are exactly suitable to his professed object, which is that of imparting Christian consolation to those whom God has chastened with affliction? Will you pretend to say that the profane, foppish style in which your Father Le Moine has talked of piety in his *Devotion made Easy* is more fitted to inspire respect than contempt for the picture that he draws of Christian virtues? What else does his whole book of *Moral Pictures* breathe, both in its prose and poetry, but a spirit full of vanity, and the follies of this world? Take, for example, that ode in his seventh book, entitled, "Eulogy on Bashfulness, showing that all beautiful things are red, or inclined to redden." Call you that a production worthy of a priest? The ode is intended to comfort a lady, called Delphina, who was sadly addicted to blushing. Each stanza is devoted to show that certain red things are the best of things, such as roses, pomegranates, the mouth, the tongue, and it is in the midst of this badinage, so disgraceful in a clergyman, that he has the effrontery to introduce those blessed spirits that minister before God, and of whom no Christian should speak without reverence.

The cherubim—those glorious choirs—
Composed of head and plumes,
Whom God with His own Spirit inspires,
And with His eyes illumes
These splendid faces, as they fly,
Are ever red and burning high,
With fire angelic or divine,
And while their mutual flames combine,
The waving of their wings supplies
A fan to cool their ecstasies!
But redness shines with better grace,
Delphina, on thy beauteous face,
Where modesty sits revelling—
Arrayed in purple like a king, &c.

What think you of this, fathers? Does this preference of the blushes of Delphina to the ardour of those spirits, which is neither more nor less than the ardour of divine love, and this simile of the fan applied to their mysterious wings, strike you as being very Christian like in the lips which consecrate the adorable body of

Jesus Christ? I am quite aware that he speaks only in the character of a gallant and to raise a smile but this is precisely what is called *laughing at things holy* And is it not certain that were he to get full justice he could not save himself from incurring a censure? although to shield himself from this he pleads an excuse which is hardly less censurable than the offence that the Sorbonne has no juris diction over Parnassus and that the errors of that land are subject neither to censure nor the Inquisition as if one could act the blasphemer and profane fellow only in prose! There is another passage however in the preface where even this excuse fails him when he says that the water of the river on whose banks he composes his verses is so apt to make poets that though it were converted into *holy water* it would not chase away the demon of poesy To match this I may add the following flight of your Father Garasse in his *Summary of the Capital Truths in Religion* where speaking of the sacred mystery of the in carnation he mixes up blasphemy and heresy in this fashion The human per sonality was grafted as it were or *set on horseback* upon the personality of the Word! And omitting many others I might mention another passage from the same author who speaking on the subject of the name of Jesus ordinarily writ ten thus I H S observes that some have taken away the cross from the top of it leaving the characters barely thus I H S—which says he is a stripped Jesus!

Such is the indecency with which you treat the truths of religion in the face of the inviolable law which binds us always to speak of them with reverence But you have sinned no less flagrantly against the rule which obliges us to speak of them with truth and discretion What is more common in your writings than calumny? Can those of Father Brisacier be called sincere? Does he speak with truth when he says that the nuns of Port Royal do not pray to the saints and have no images in their church? Are not these most outrageous falsehoods when the contrary appears before the eyes of all Paris? And can he be said to speak with discretion when he stabs the fair reputation of these virgins who lead a life so pure and austere representing them as impenitent unsacramentalists un communicants foolish virgins visionaries Calagans desperate creatures and anything you please loading them with many other slanders which have justly incurred the censure of the late Archbishop of Paris? Or when he calumniates priests of the most irreproachable morals by asserting that they practise novel ties in confession to entrap handsome innocent females and that he would be horrified to tell the abominable crimes which they commit Is it not a piece of intolerable assurance to advance slanders so black and base not merely without proof but without the slightest shadow or the most distant semblance of truth? I shall not enlarge on this topic but defer it to a future occasion for I have something more to say to you about it but what I have now produced is enough to show that you have sinned at once against truth and discretion

But it may be said perhaps that you have not offended against the last rule at least which binds you to desire the salvation of those whom you denounce and that none can charge you with this except by unlocking the secrets of your breasts which are only known to God It is strange fathers but true neverthe less that we can convict you even of this offence that while your hatred to your opponents has carried you so far as to wish their eternal perdition your infatua tion has driven you to discover the abominable wish that so far from cherishing in secret desires for their salvation you have offered up prayers in public for their

damnation, and that, after having given utterance to that hideous vow in the city of Caen, to the scandal of the whole Church, you have since then ventured, in Paris, to vindicate, in your printed books, the diabolical transaction After such gross offences against piety, first ridiculing and speaking lightly of things the most sacred, next falsely and scandalously calumniating priests and virgins, and lastly, forming desires and prayers for their damnation, it would be difficult to add anything worse I cannot conceive, fathers, how you can fail to be ashamed of yourselves, or how you could have thought for an instant of charging me with a want of charity, who have acted all along with so much truth and moderation, without reflecting on your own horrid violations of charity, manifested in those deplorable exhibitions, which make the charge recoil against yourselves

In fine, fathers, to conclude with another charge which you bring against me, I see you complain that among the vast number of your maxims which I quote, there are some which have been objected to already, and that I say over again, what others have said before me " To this I reply that it is just because you have not profited by what has been said before that I say it over again Tell me now what fruit has appeared from all the castigations you have received in all the books written by learned doctors and even the whole University? What more *have your fathers Annat*, Caussin, Pintereau, *and Le Moine done, in the replies* they have put forth, except loading with reproaches those who had given them salutary admonitions? Have you suppressed the books in which these nefarious maxims are taught? Have you restrained the authors of these maxims? Have you become more circumspect in regard to them? On the contrary, is it not the fact *that since that time Escobar has been repeatedly reprinted in France and in the* Low Countries, and that your fathers Cellot, Bagot, Bauny, Lamy, Le Moine, and others, persist in publishing daily the same maxims over again, or new ones as licentious as ever? Let us hear no more complaints, then, fathers, either because I have charged you with maxims which you have not disavowed, or because I *have objected to some new ones against you*, or because I have laughed equally at them all You have only to sit down and look at them, to see at once your own confusion and my defence Who can look without laughing at the decision of Bauny, respecting the person who employs another to set fire to his neighbour s barn, that of Cellot on restitution, the rule of Sanchez in favour of sorcerers, the plan of Hurtado *for avoiding the sin of duelling by* taking a walk through a field and waiting for a man, the compliments of Bauny for escaping usury, the way of avoiding simony by a detour of the intention, and keeping clear of falsehood by speaking high and low, and such other opinions of your most grave and reverend doctors? Is there anything more necessary, fathers, for my vindication? And, as *Tertullian says, can anything* be more justly due to the vanity and weakness of these opinions than laughter? But, fathers, the corruption of manners, to which your maxims lead, deserves another sort of consideration, and it becomes us to ask with the same ancient writer Whether ought *we to laugh at their folly*, or deplore their blindness?—*Rideam vanitatem, an exprobrem caecitatem?* My humble opinion is that one may either laugh at them or weep over them, as one is in the humour '*Haec tolerabilius vel ridentur vel flentur*, as St Augustine says The Scripture tells us that there is a time to laugh and a time to weep , and my hope is, fathers, that I may not find verified, in your case, these words in the Proverbs

If a wise man contendeth with a foolish man whether he rage or laugh there is no rest

P S—On finishing this letter there was put in my hands one of your publications in which you accuse me of falsification in the case of six of your maxims quoted by me and also with being in correspondence with heretics You will shortly receive I trust a suitable reply after which fathers I rather think you will not feel very anxious to continue this species of warfare

LETTER XII

TO THE REVEREND FATHERS THE JESUITS

September 9 1656

REVEREND FATHERS

I was prepared to write you on the subject of the abuse with which you have for some time past been assailing me in your publications in which you salute me with such epithets as reprobate buffoon blockhead merry Andrew impostor slanderer cheat heretic Calvinist in disguise disciple of Du Moulin possessed with a legion of devils and everything else you can think of As I should be sorry to have all this believed of me I was anxious to show the public why you treated me in this manner and I had resolved to complain of your calumnies and falsifications when I met with your *Answers* in which you bring these same charges against myself This will compel me to alter my plan though it will not prevent me from prosecuting it in some sort for I hope while defending myself to convict you of impostures more genuine than the imaginary ones which you have ascribed to me Indeed fathers the suspicion of foul play is much more sure to rest on you than on me It is not very likely standing as I do alone without power or any human defence against such a large body and having no support but truth and integrity that I would expose myself to lose everything by laying myself open to be convicted of imposture It is too easy to discover falsifications in matters of fact such as the present In such a case there would have been no want of persons to accuse me nor would justice have been denied them With you fathers the case is very different you may say as much as you please against me while I may look in vain for any to complain to With such a wide difference between our positions though there had been no other consideration to restrain me it became me to study no little caution By treating me however as a common slanderer you compel me to assume the defensive and you must be aware that this cannot be done without entering into a fresh exposition and even into a fuller disclosure of the points of your morality In provoking this discussion I fear you are not acting as good politicians The war must be waged within your own camp and at your own expense and although you imagine that by embroiling the questions with scholastic terms the answers will be so tedious thorny and obscure that people will lose all relish for the controversy this may not perhaps turn out to be exactly the case I shall use my best endeavours to tax your patience as little as possible with that sort of writing Your maxims have something diverting about them which keeps up the

good humour of people to the last At all events, remember that it is you that oblige me to enter upon this *éclaircissement*, and let us see which of us comes off best in self defence

The first of your *Impostures*, as you call them, is on the opinion of Vasquez upon alms giving To avoid all ambiguity, then, allow me to give a simple explanation of the matter in dispute It is well known, fathers, that, according to the mind of the Church, there are two precepts touching alms *1st*, To give out of our superfluity in the case of the ordinary necessities of the poor , and *2nd*, To give even out of our necessaries, according to our circumstances, in cases of extreme necessity ' Thus says Cajetan, after St Thomas, so that, to get at the mind of Vasquez on this subject, we must consider the rules he lays down, both in regard to necessaries and superfluities

With regard to superfluity, which is the most common source of relief to the poor, it is entirely set aside by that single maxim which I have quoted in my *Letters* That what the men of the world keep with the view of improving their own condition, and that of their relatives, is not properly superfluity, so that such a thing as superfluity is rarely to be met with among men of the world, not even excepting kings It is very easy to see, fathers, that, according to this definition, none can have superfluity, provided they have ambition, and thus, so far as the greater part of the world is concerned, alms giving is annihilated But even though a man should happen to have superfluity, he would be under no obligation, according to Vasquez, to give it away in the case of ordinary necessity, for he protests against those who would thus bind the rich Here are his own words Corduba, ' says he, ' teaches that when we have a superfluity we are bound to give out of it in cases of ordinary necessity, but *this does not please me—sed hoc non placet*—for we have demonstrated the contrary against Cajetan and Navarre So, fathers, the obligation to this kind of alms is wholly set aside, according to the good pleasure of Vasquez

With regard to necessaries, out of which we are bound to give in cases of extreme and urgent necessity, it must be obvious, from the conditions by which he has limited the obligation, the richest man in all Paris may not come within its reach one in a lifetime I shall only refer to two of these The first is That *we must know* that the poor man cannot be relieved from any other quarter—*hæc intelligo et cætera omnia, quando* scio *nullum alium opem laturum* ' What say you to this, fathers? Is it likely to happen frequently in Paris, where there are so many charitable people, that I *must know* that there is not another soul but myself to relieve the poor wretch who begs an alms from me? And yet according to Vasquez, if I have not ascertained that fact, I may send him away with nothing The second condition is That the poor man be reduced to such straits that he is menaced with some fatal accident or the ruin of his character —none of them very common occurrences But what marks still more the rarity of the cases in which one is bound to give charity is his remark in another passage that the poor man must be so ill off, that he may conscientiously rob the rich man! This must surely be a very extraordinary case unless he will insist that a man may be ordinarily allowed to commit robbery And so, after having cancelled the obligation to give alms out of our superfluities, he obliges the rich to relieve the poor only in those cases when he would allow the poor to rifle the rich! Such is the doctrine of Vasquez, to whom you refer your readers for their edification!

I now come to your pretended *Impostures* You begin by enlarging on the obligation to alms giving which Vasquez imposes on ecclesiastics But on this point I have said nothing and I am prepared to take it up whenever you choose This then has nothing to do with the present question As for laymen who are the only persons with whom we have now to do you are apparently anxious to have it understood that in the passage which I quoted Vasquez is giving not his own judgement but that of Cajetan But as nothing could be more false than this and as you have not said it in so many terms I am willing to believe for the sake of your character that you did not intend to say it

You next loudly complain that after quoting that maxim of Vasquez Such a thing as superfluity is rarely if ever to be met with among men of the world not excepting kings *I have inferred* from it that the rich are rarely if ever bound to give alms out of their superfluity But what do you mean to say fathers? If it be true that the rich have almost never superfluity is it not obvious that they will almost never be bound to give alms out of their superfluity? I might have put it into the form of a syllogism for you if Diana who has such an esteem for Vasquez that he calls him the phoenix of genius had not drawn the same conclusion from the same premisses for after quoting the maxim of Vasquez he concludes that with regard to the question whether the rich are obliged to give alms out of their superfluity though the affirmation were true it would seldom or almost never happen to be obligatory in practice I have followed this language word for word What then are we to make of this fathers? When Diana quotes with approbation the sentiments of Vasquez when he finds them probable and very convenient for rich people as he says in the same place he is no slanderer no falsifier and we hear no complaints of misrepresenting his author whereas when I cite the same sentiments of Vasquez though without holding him up as a phoenix I am a slanderer a fabricator a corrupter of his maxims Truly fathers you have some reason to be apprehensive lest your very different treatment of those who agree in their representation and differ only in their estimate of your doctrine discover the real secret of your hearts and provoke the conclusion that the main object you have in view is to maintain the credit and glory of your Company It appears that provided your accommodating theology is treated as judicious complaisance you never disavow those that publish it but laud them as contributing to your design but let it be held forth as pernicious laxity and the same interest of your Society prompts you to disclaim the maxims which would injure you in public estimation And thus you recognize or renounce them not according to the truth which never changes but according to the shifting exigencies of the times acting on that motto of one of the ancients *Omnia pro tempore nihil pro veritate*—Anything for the times nothing for the truth Beware of this fathers and that you may never have it in your power again to say that I drew from the principle of Vasquez a conclusion which he had disavowed I beg to inform you that he has drawn it himself According to the opinion of Cajetan and according to *my own—et secundum nostram*—(he says chap 1 no 27) one is hardly obliged to give alms at all when one is only obliged to give them out of one s superfluity Confess then fathers on the testimony of Vasquez himself that I have exactly copied his sentiment and think how you could have the conscience to say that the reader on consulting the original would see to his astonishment that he there teaches the very reverse!

In fine, you insist, above all, that if Vasquez does not bind the rich to give alms out of their superfluity, he obliges them to atone for this by giving out of the necessaries of life But you have forgotten to mention the list of conditions which he declares to be essential to constitute that obligation, which I have quoted, and which restrict it in such a way as almost entirely to annihilate it In place of giving this honest statement of his doctrine, you tell us, in general terms, that he obliges the rich to give even what is necessary to their condition This is proving too much, fathers, the rule of the Gospel does not go so far, and it would be an error, into which Vasquez is very far, indeed, from having fallen To cover his laxity, you attribute to him an excess of severity which would be reprehensible, and thus you lose all credit as faithful reporters of his sentiments But the truth is, Vasquez is quite free from any such suspicion, for he has maintained, as I have shown, that the rich are not bound, either in justice or in charity, to give of their superfluities, and still less of their necessaries, to relieve the ordinary wants of the poor, and that they are not obliged to give of the necessaries, except in cases so rare that they almost never happen

Having disposed of your objections against me on this head, it only remains to show the falsehood of your assertion that Vasquez is more severe than Cajetan This will by very easily done That cardinal teaches that we are bound in justice to give alms out of our superfluity, even in the ordinary wants of the poor, because, according to the holy fathers, the rich are merely the dispensers of their superfluity, which they are to give to whom they please, among those who have need of it " And accordingly, unlike Diana, who says of the maxims of Vasquez that they will be ' very convenient and agreeable to the rich and their confessors," the cardinal, who has no such consolation to afford them, declares that he has nothing to say to the rich but these words of Jesus Christ It is easier for a camel to go through the eye of a needle, than for a rich man to enter into heaven , and to their confessors If the blind lead the blind, both shall fall into the ditch ' So indispensable did he deem this obligation! This, too, is what the fathers and all the saints have laid down as a certain truth There are two cases, says St Thomas, in which we are bound to give alms as a matter of justice—*ex debito legali* one, when the poor are in danger, the other, when we possess superfluous property And again The three tenths which the Jews were bound to eat with the poor, have been augmented under the new law, for Jesus Christ wills that we give to the poor, not the tenth only, but the whole of our superfluity ' And yet it does not seem good to Vasquez that we should be obliged to give even a fragment of our superfluity, such is his complaisance to the rich, such his hardness to the poor, such his opposition to those feelings of charity which teach us to relish the truth contained in the following words of St Gregory, harsh as it may sound to the rich of this world ' When we give the poor what is necessary to them, we are not so much bestowing on them what is our property as rendering to them what is their own, and it may be said to be an act of justice rather than a work of mercy "

It is thus that the saints recommend the rich to share with the poor the good things of this earth, if they would expect to possess with them the good things of heaven While you make it your business to foster in the breasts of men that ambition which leaves no superfluity to dispose of and that avarice which refuses to part with it, the saints have laboured to induce the rich to give up their super-

fluity and to convince them that they would have abundance of it provided they measured it not by the standard of covetousness which knows no bounds to its cravings but by that of piety which is ingenious in retrenchments so as to have wherewith to diffuse itself in the exercise of charity We will have a great deal of superfluity says St Augustine if we keep only what is necessary but if we seek after vanities we will never have enough Seek brethren what is sufficient for the work of God —that is for nature— and not for what is sufficient for your covetousness which is the work of the devil and remember that the superfluities of the rich are the necessaries of the poor

I would fondly trust fathers that what I have now said to you may serve not only for my vindication—that were a small matter—but also to make you feel and detest what is corrupt in the maxims of your casuists and thus unite us sincerely under the sacred rules of the Gospel according to which we must all be judged

As to the second point which regards simony before proceeding to answer the charges you have advanced against me I shall begin by illustrating your doctrine on this subject Finding yourselves placed in an awkward dilemma between the canons of the Church which impose dreadful penalties upon simoniacs on the one hand and the avarice of many who pursue this infamous traffic on the other you have recourse to your ordinary method which is to yield to men what they desire and give the Almighty only words and shows For what else does the simoniac want but money in return for his benefice? And yet this is what you exempt from the charge of simony And as the name of *simony* must still remain standing and a subject to which it may be ascribed you have substituted in the place of this an imaginary idea which never yet crossed the brain of a simoniac and would not serve him much though it did—the idea namely that simony lies in estimating the money considered in itself as highly as the spiritual gift or office considered in itself Who would ever take it into his head to compare things so utterly disproportionate and heterogeneous? And yet provided this metaphysical comparison be not drawn any one may according to your authors give away a benefice and receive money in return for it without being guilty of simony

Such is the way in which you sport with religion in order to gratify the worst passions of men and yet only see with what gravity your Father Valentia delivers his rhapsodies in the passage cited in my letters He says One may give a spiritual for a temporal good in two ways—first in the way of prizing the temporal more than the spiritual and that would be simony secondly in the way of taking the temporal as the motive and end inducing one to give away the spiritual but without prizing the temporal more than the spiritual and then it is not simony And the reason is that simony consists in receiving something temporal as the just price of what is spiritual If therefore the temporal is sought—*si petatur temporale*—not as the *price* but only as the *motive* determining us to part with the spiritual it is by no means simony even although the possession of the temporal may be principally intended and expected—*minime erit simonia etiamsi temporale principaliter intendatur et expectetur* Your redoubtable Sanchez has been favoured with a similar revelation Escobar quotes him thus If one give a spiritual for a temporal good not as the *price* but as a *motive* to induce the collator to give it or as an *acknowledgement* if the benefice has been actually received is that simony? Sanchez assures us that it is not In your Caen Theses of 1644 you say It is a probable opinion taught by many Catholics that it is not simony to

exchange a temporal for a spiritual good, when the former is not given as a price And as to Tanner, here is his doctrine, exactly the same with that of Valentia, and I quote it again to show you how far wrong it is in you to complain of me for saying that it does not agree with that of St Thomas, for he avows it himself in the very passage which I quoted in my letter "There is properly and truly no simony, says he, unless when a temporal good is taken as the price of a spiritual, but when taken merely as the motive for giving the spiritual, or as an acknowledgement for having received it, this is not simony, at least in point of conscience" And again The same thing may be said, although the temporal should be regarded as the principal end, and even preferred to the spiritual, although St Thomas and others appear to hold the reverse, inasmuch as they maintain it to be downright simony to exchange a spiritual for a temporal good, when the temporal is the end of the transaction

Such, then, being your doctrine on simony, as taught by your best authors, who follow each other very closely in this point, it only remains now to reply to your charges of misrepresentation You have taken no notice of Valentia s opinion, so that his doctrine stands as it was before But you fix on that of Tanner, maintaining that he has merely decided it to be no simony by divine right, and you would have it to be believed that, in quoting the passage, I have suppressed these words, *divine right* This, fathers, is a most unconscionable trick, for these words, *divine right*, never existed in that passage You add that Tanner declares it to be simony according to *positive right* But you are mistaken, he does not say that generally, but only of particular cases, or, as he expresses it, *in casibus a jure expressis*, by which he makes an exception to the general rule he had laid down in that passage, that it is not simony in point of conscience, which must imply *that it is not so in point of positive right*, unless you would have Tanner made so impious as to maintain that simony, in point of positive right, is not simony in point of conscience But it is easy to see your drift in mustering up such terms as divine right, positive right, natural right, internal and external tribunal, expressed cases, outward presumption, ' and others equally little known, you mean to escape under this obscurity of language, and make us lose sight of your aberrations But, fathers, you shall not escape by these vain artifices, for I shall put some questions to you so simple, that they will not admit of coming under your *distinguo*

I ask you, then, without speaking of positive rights, of outward presumptions, or "external tribunals —I ask if, according to your authors, a beneficiary would be simoniacal, were he to give a benefice worth four thousand livres of yearly rent, and to receive ten thousand francs ready money not as the price of the benefice, but merely as a motive inducing him to give it? Answer me plainly, fathers What must we make of such a case as this according to your authors? Will not Tanner tell us decidedly that this is not simony in point of conscience, seeing that the temporal good is not the price of the benefice but only the motive inducing to dispose of it? Will not Valentia, will not your own Theses of Caen, will not Sanchez and Escobar, agree in the same decision and give the same reason for it? Is anything more necessary to exculpate that beneficiary from simony? And, whatever might be your private opinion of the case, durst you deal with that man as a simonist in your confessionals when he would be entitled to stop your mouth by telling you that he acted according to the advice of so many grave

doctors? Confess candidly then that according to your views that man would be no simonist and having done so defend the doctrine as you best can

Such fathers is the true mode of treating questions in order to unravel instead of perplexing them either by scholastic terms or as you have done in your last charge against me here by altering the state of the question Tanner you say has at any rate declared that such an exchange is a great sin and you blame me for having maliciously suppressed this circumstance which you maintain *completely justifies him* But you are wrong again and that in more ways than one For first though what you say had been true it would be nothing to the point the question in the passage to which I referred being not if it was *sin* but if it was *simony* Now these are two very different questions Sin according to your maxims obliges only to confession—simony obliges to restitution and there are people to whom these may appear two very different things You have found expedients for making confession a very easy affair but you have not fallen upon ways and means to make restitution an agreeable one Allow me to add that the case which Tanner charges with sin is not simply that in which a spiritual good is exchanged for a temporal the latter being the principal end in view but that in which the party prizes the temporal above the spiritual which is the imaginary case already spoken of And it must be allowed he could not go far wrong in charging such a case as that with sin since that man must be either very wicked or very stupid who when permitted to exchange the one thing for the other would not avoid the sin of the transaction by such a simple process as that of abstaining from comparing the two things together Besides Valentia in the place quoted when treating the question—if it be sinful to give a spiritual good for a temporal the latter being the main consideration—and after producing the reasons given for the affirmative adds *Sed hoc non videtur mihi satis certum*—But this does not appear to my mind sufficiently certain

Since that time however your father Erade Bille professor of cases of conscience at Caen has decided that there is no sin at all in the case supposed for probable opinions you know are always in the way of advancing to maturity This opinion he maintains in his writings of 1644 against which M Dupre doctor and professor at Caen delivered that excellent oration since printed and well known For though this Erade Bille confesses that Valentia s doctrine adopted by Father Milhard and condemned by the Sorbonne is contrary to the common opinion suspected of simony and punishable at law when discovered in practice he does not scruple to say that it is a probable opinion and consequently sure in point of conscience and that there is neither simony nor sin in it

It is a probable opinion he says taught by many Catholic doctors that there is neither any simony *nor any sin* in giving money or any other temporal thing for a benefice either in the way of acknowledgement or as a motive without which it would not be given provided it is not given as a price equal to the benefice This is all that could possibly be desired In fact according to these maxims of yours simony would be so exceedingly rare that we might exempt from this sin even Simon Magus himself who desired to purchase the Holy Spirit and is the emblem of those simonists that buy spiritual things and Gehazi who took money for a miracle and may be regarded as the prototype of the simonists that sell them There can be no doubt that when Simon as we read in the Acts offered the apostles money saying Give me also this power he said

nothing about buying or selling, or fixing the price, he did no more than offer the money as a motive to induce them to give him that spiritual gift, which being, according to you, no simony at all, he might, had be but been instructed in your maxims, have escaped the anathema of St Peter The same unhappy ignorance was a great loss to Gehazi, when he was struck with leprosy by Elisha, for, as he accepted the money from the prince who had been miraculously cured, simply as an acknowledgement, and not as a price equivalent to the divine virtue which had effected the miracle, he might have insisted on the prophet healing him again on pain of mortal sin, seeing, on this supposition, he would have acted according to the advice of your grave doctors, who, in such cases, oblige con fessors to absolve their penitents and to wash them from that spiritual leprosy of which the bodily disease is the type

Seriously, fathers, it would be extremely easy to hold you up to ridicule in this matter, and I am at a loss to know why you expose yourselves to such treatment To produce this effect, I have nothing more to do than simply to quote Escobar, in his *Practice of Simony according to the Society of Jesus,* "Is it simony when two Churchmen become mutually pledged thus Give me your vote for my election as Provincial, and I shall give you mine for your election as prior? By no means Or take another "It is not simony to get possession of a benefice by promising a sum of money, when one has no intention of actually paying the money, for this is merely making a show of simony, and is as far from being real simony as counterfeit gold is from the genuine " By this quirk of conscience, he has con trived means, in the way of adding swindling to simony, for obtaining benefices without simony and without money

But I have no time to dwell longer on the subject, for I must say a word or two in reply to your third accusation, which refers to the subject of bankrupts Noth- ing can be more gross than the manner in which you have managed this charge You rail at me as a libeller in reference to a sentiment of Lessius, which I did not quote myself, but took from a passage in Escobar, and, therefore, though it were true that Lessius does not hold the opinion ascribed to him by Escobar, what can be more unfair than to charge me with the misrepresentation? When I quote Lessius or others of your authors myself, I am quite prepared to answer for it, but, as Escobar has collected the opinions of twenty four of your writers, I beg to ask if I am bound to guarantee anything beyond the correctness of my citations from his book? Or if I must, in addition answer for the fidelity of all his quota- tions of which I may avail myself? This would be hardly reasonable, and yet this is precisely the case in the question before us I produced in my letter the follow- ing passage from Escobar, and you do not object to the fidelity of my translation ' May the bankrupt, with a good conscience, retain as much of his property as is necessary to afford him an honourable maintenance—*ne indecore vivat?* I answer, with Lessius, that he may—*cum Lessio assero posse* You tell me that Lessius does not hold that opinion But just consider for a moment the predicament in which you involve yourselves If it turns out that he does hold that opinion, you will be set down as impostors for having asserted the contrary, and if it is proved that he does not hold it, Escobar will be the impostor so it must now of necessity follow that one or other of the Society will be convicted of imposture Only think what a scandal! You cannot, it would appear, foresee the consequences of things You seem to imagine that you have nothing more to do than to cast aspersions upon

people without considering on whom they may recoil Why did you not acquaint Escobar with your objection before venturing to publish it? He might have given you satisfaction It is not so very troublesome to get word from Valladolid where he is living in perfect health and completing his grand work on *Moral Theology* in six volumes on the first of which I mean to say a few words by and by They have sent him the first ten letters you might as easily have sent him your objection and I am sure he would have soon returned you an answer for he has doubtless seen in Lessius the passage from which he took the *ne indecore vivat* Read him yourselves fathers and you will find it word for word as I have done Here it is The same thing is apparent from the authorities cited particularly in regard to that property which he acquires after his failure out of which even the delinquent debtor may retain as much as is necessary for his honourable maintenance according to his station of life—*ut non indecore vivat* Do you ask if this rule applies to goods which he possessed at the time of his failure? Such seems to be the judgement of the doctors

I shall not stop here to show how Lessius to sanction his maxim perverts the law that allows bankrupts nothing more than a mere livelihood and that makes no provision for honourable maintenance It is enough to have vindicated Escobar from such an accusation—it is more indeed than what I was in duty bound to do But you fathers have not done your duty It still remains for you to answer the passage of Escobar whose decisions by the way have this advantage that being entirely independent of the context and condensed in little articles they are not liable to your distinctions I quoted the whole of the passage in which bankrupts are permitted to keep their goods though unjustly acquired to provide an honourable maintenance for their families —commenting on which in my letters I exclaim Indeed father! by what strange kind of charity would you have the ill gotten property of a bankrupt appropriated to his own use instead of that of his lawful creditors? This is the question which must be answered but it is one that involves you in a sad dilemma and from which you in vain seek to escape by altering the state of the question and quoting other passages from Lessius which have no connection with the subject I ask you then May this maxim of Escobar be followed by bankrupts with a safe conscience or no? And take care what you say If you answer No what becomes of your doctor and your doctrine of probability? If you say Yes I delate you to the Parliament

In this predicament I must now leave you fathers for my limits will not permit me to overtake your next accusation which respects homicide This will serve for my next letter and the rest will follow

In the meanwhile I shall make no remarks on the advertisements which you have tagged to the end of each of your charges filled as they are with scandalous falsehoods I mean to answer all these in a separate letter in which I hope to show the weight due to your calumnies I am sorry fathers that you should have recourse to such desperate resources The abusive terms which you heap on me will not clear up our disputes nor will your manifold threats hinder me from defending myself You think you have power and impunity on your side and I think I have truth and innocence on mine It is a strange and tedious war when violence attempts to vanquish truth All the efforts of violence cannot weaken truth and only serve to give it fresh vigour All the lights of truth cannot arrest

violence, and only serve to exasperate it When force meets force, the weaker must succumb to the stronger, when argument is opposed to argument, the solid and the convincing triumphs over the empty and the false, but violence and verity can make no impression on each other Let none suppose, however, that the two are, therefore, equal to each other, for there is this vast difference between them, that violence has only a certain course to run, limited by the appointment of Heaven, which overrules its effects to the glory of the truth which it assails, whereas verity endures forever and eventually triumphs over its enemies, being eternal and almighty as God himself

LETTER XIII

To the reverend fathers of the society of jesus

September 30, 1656

Reverend Fathers,

I have just seen your last production, in which you have continued your list of *Impostures* up to the twentieth and intimate that you mean to conclude with this the first part of your accusations against me, and to proceed to the second, in which you are to adopt a new mode of defence, by showing that there are other casuists besides those of your Society who are as lax as yourselves I now see the precise number of charges to which I have to reply, and as the fourth, to which we have now come, relates to homicide, it may be proper, in answering it, to include the 11th, 13th, 14th, 15th, 16th, 17th, and 18th, which refer to the same subject

In the present letter, therefore, my object shall be to vindicate the correctness of my quotations from the charges of falsity which you bring against me But as you have ventured, in your pamphlets, to assert that the sentiments of your authors on murder are agreeable to the decisions of popes and ecclesiastical laws,' you will compel me, in my next letter, to confute a statement at once so unfounded and so injurious to the Church It is of some importance to show that she is innocent of your corruptions, in order that heretics may be prevented from taking advantage of your aberrations, to draw conclusions tending to her dishonour And thus, viewing on the one hand your pernicious maxims and on the other the canons of the Church which have uniformly condemned them, people will see, at one glance, what they should shun and what they should follow

Your fourth charge turns on a maxim relating to murder, which you say I have falsely ascribed to Lessius It is as follows 'That if a man has received a buffet, he may immediately pursue his enemy, and even return the blow with the sword, not to avenge himself, but to retrieve his honour This, you say, is the opinion of the casuist Victoria But this is nothing to the point There is no inconsistency in saying that it is at once the opinion of Victoria and of Lessius, for Lessius himself says that it is also held by Navarre and Henriquez, who teach identically the same doctrine The only question then is if Lessius holds this view as well as his brother casuists You maintain that Lessius quotes this opinion solely for

the purpose of refuting it and that I therefore attribute to him a sentiment which he produces only to overthrow—the basest and most disgraceful act of which a writer can be guilty Now I maintain fathers that he quotes the opinion solely for the purpose of supporting it Here is a question of fact which it will be very easy to settle Let us see then how you prove your allegation and you will see afterwards how I prove mine

To show that Lessius is not of that opinion you tell us that he condemns the practice of it and in proof of this you quote one passage of his (l 2 c 9 n 92) in which he says in so many words I condemn the practice of it I grant that on looking for these words at number 92 to which you refer they will be found there But what will people say fathers when they discover at the same time that he is treating in that place of a question totally different from that of which we are speaking and that the opinion of which he there says that he condemns the practice has no connection with that now in dispute but is quite distinct? And yet to be convinced that this is the fact we have only to open the book to which you refer and there we find the whole subject in its connection as follows At number 79 he treats the question If it is lawful to kill for a buffet? and at number 80 he finishes this matter without a single word of condemnation Having disposed of this question he opens a new one at 81 namely If it is lawful to kill for slanders? and it is when speaking of *this* question that he employs the words you have quoted I condemn the practice of it

Is it not shameful fathers that you should venture to produce these words to make it be believed that Lessius condemns the opinion that it is lawful to kill for a buffet? and that on the ground of this single proof you should chuckle over it as you have done by saying Many persons of honour in Paris have already discovered this notorious falsehood by consulting Lessius and have thus ascertained the degree of credit due to that slanderer? Indeed! and is it thus that you abuse the confidence which those persons of honour repose in you? To show them that Lessius does not hold a certain opinion you open the book to them at a place where he is condemning another opinion and these persons not having begun to mistrust your good faith and never thinking of examining whether the author speaks in that place of the subject in dispute you impose on their credulity I make no doubt fathers that to shelter yourselves from the guilt of such a scandalous lie you had recourse to your doctrine of equivocations and that having read the passage *in a loud voice* you would say *in a lower key* that the author was speaking there of something else But I am not so sure whether this saving clause which is quite enough to satisfy your consciences will be a very satisfactory answer to the just complaint of those honourable persons when they shall discover that you have hoodwinked them in this style

Take care then fathers to prevent them by all means from seeing my letters for this is the only method now left to you to preserve your credit for a short time longer This is not the way in which I deal with your writings I send them to all my friends I wish everybody to see them And I verily believe that both of us are in the right for our own interests for after having published with such parade this fourth *Imposture* were it once discovered that you have made it up by foisting in one passage for another you would be instantly denounced It will be easily seen that if you could have found what you wanted in the passage where Lessius treated of this matter you would not have searched for it elsewhere and

that you had recourse to such a trick only because you could find nothing in that passage favourable to your purpose

You would have us believe that we may find in Lessius what you assert, 'that he does *not* allow that this opinion (that a man may be lawfully killed for a buffet) is probable in theory', whereas Lessius distinctly declares, at number 80 'This opinion, that a man may kill for a buffet, *is* probable in theory' Is not this, word for word, the reverse of your assertion? And can we sufficiently admire the hardihood with which you have advanced, in set phrase, the very reverse of a matter of fact! To your conclusion, from a fabricated passage, that Lessius was *not* of that opinion, we have only to place Lessius himself, who, in the genuine passage, declares that he *is* of that opinion

Again, you would have Lessius to say 'that he condemns the practice of it', and, as I have just observed, there is not in the original a single word of condemnation, all that he says is 'It appears that it ought not to be *easily* permitted in practice—*In praxi non videtur* facile *permittenda*' Is that, fathers, the language of a man who *condemns* a maxim? Would you say that adultery and incest ought not to be *easily permitted* in practice? Must we not, on the contrary, conclude that as Lessius says no more than that the practice ought not to be easily permitted, his opinion is that it may be permitted sometimes, though rarely? And, as if he had been anxious to apprise everybody when it might be permitted, and to relieve those who have received affronts from being troubled with unreasonable scruples from not knowing on what occasions they might lawfully kill in practice, he has been at pains to inform them what they ought to avoid in order to practise the doctrine with a safe conscience Mark his words 'It seems,' says he, 'that it ought not to be easily permitted, *because* of the danger that persons may act in this matter out of hatred or revenge, or with excess, or that this may occasion too many murders' From this it appears that murder is freely permitted by Lessius, if one avoids the inconveniences referred to—in other words, if one can act without hatred or revenge and in circumstances that may not open the door to a great many murders To illustrate the matter, I may give you an example of recent occurrence—the case of the buffet of Compiegne You will grant that the person who received the blow on that occasion has shown by the way in which he has acted, that he was sufficiently master of the passions of hatred and revenge It only remained for him therefore, to see that he did not give occasion to too many murders, and you need hardly be told, fathers, it is such a rare spectacle to find Jesuits bestowing buffets on the officers of the royal household that he had no great reason to fear that a murder committed on this occasion would be likely to draw many others *in its train* You cannot, accordingly, deny that the Jesuit who figured on that occasion was *killable* with a safe conscience, and that the offended party might have converted him into a practical illustration of the doctrine of Lessius And very likely, fathers, this might have been the result had he been educated in your school, and learnt from Escobar that the man who has received a buffet is held to be disgraced until he has taken the life of him who insulted him But there is ground to believe that the very different instructions which he received from a curate who is no great favourite of yours have contributed not a little in this case to save the life of a Jesuit

Tell us no more then of inconveniences which may in many instances be so easily got over, and in the absence of which, according to Lessius, murder is

permissible even in practice This is frankly avowed by your authors as quoted by Escobar in his *Practice of Homicide according to your Society* Is it allowable asks this casuist to kill him who has given me a buffet? Lessius says it is permissible in speculation though not to be followed in practice—*non consulendum in praxi*—on account of the risk of hatred or of murders prejudicial to the State Others however have judged that *by avoiding th se inconveniences this is permissible and safe in practice—in praxi probabilem et tutam judicarunt Henriquez* &c See how your opinions mount up by little and little to the climax of probabilism! The present one you have at last elevated to this position by permitting murder without any distinction between speculation and practice in the following terms It is lawful when one has received a buffet to return the blow immediately with the sword not to avenge one s self but to preserve one s honour Such is the decision of your fathers of Caen in 1644 embodied in their publications produced by the university before parliament when they presented their third remonstrance against your doctrine of homicide as shown in the book then emitted by them on page 339

Mark then fathers that your own authors have themselves demolished this absurd distinction between speculative and practical murder—a distinction which the university treated with ridicule and the invention of which is a secret of your policy which it may now be worth while to explain The knowledge of it besides being necessary to the right understanding of your 15th 16th 17th and 18th charges is well calculated in general to open up by little and little the principles of that mysterious policy

In attempting as you have done to decide cases of conscience in the most agreeable and accommodating manner while you met with some questions in which religion alone was concerned—such as those of contrition penance love to God and others only affecting the inner court of conscience—you encountered another class of cases in which civil society was interested as well as religion—such as those relating to usury bankruptcy homicide and the like And it is truly distressing to all that love the Church to observe that in a vast number of instances in which you had only Religion to contend with you have violated her laws without reservation without distinction and without compunction because you knew that it is not here that God visibly administers his justice But in those cases in which the State is interested as well as Religion your apprehension of man s justice has induced you to divide your decisions into two shares To the first of these you give the name of *speculation* under which category crimes considered in themselves without regard to society but merely to the law of God you have permitted without the least scruple and in the way of trampling on the divine law which condemns them The second you rank under the denomination of *practice* and here considering the injury which may be done to society and the presence of magistrates who look after the public peace you take care in order to keep yourselves on the safe side of the law not to approve always in practice the murders and other crimes which you have sanctioned in speculation Thus for example on the question If it be lawful to kill for slanders? your authors Filiutius Reginald and others reply This is permitted in speculation—*ex probabile opinione licet* but is not to be approved in *practice* on account of the great number of murders which might ensue and which might injure the State if all slanderers were to be killed *and also because one might be punished in a court of justice for having killed another for that matter* Such is the style in which your

opinions begin to develop themselves, under the shelter of this distinction, in virtue of which, without doing any sensible injury to society, you only ruin religion In acting thus, you consider yourselves quite safe You suppose that, on the one hand, the influence you have in the Church will effectually shield from punishment your assaults on truth, and that, on the other, the precautions you have taken against too easily reducing your permissions to practice will save you on the part of the civil powers, who, not being judges in cases of conscience, are properly concerned only with the outward practice Thus an opinion which would be condemned under the name of *practice*, comes out quite safe under the name of *speculation* But this basis once established, it is not difficult to erect on it the rest of your maxims There is an infinite distance between God s prohibition of murder and your speculative permission of the crime, but between that permission and the practice the distance is very small indeed It only remains to show that what is allowable in speculation is also so in practice, and there can be no want of reasons for this You have contrived to find them in far more difficult cases Would you like to see, fathers, how this may be managed? I refer you to the reasoning of Escobar, who has distinctly decided the point in the first six volumes of his grand *Moral Theology*, of which I have already spoken—a work in which he shows quite another spirit from that which appears in his former compilation from your four and twenty elders At that time he thought that there might be opinions probable in speculation, which might not be safe in practice, but he has now come to form an opposite judgment, and has, in this, his latest work, confirmed it Such is the wonderful growth attained by the doctrine of probability in general, as well as by every probable opinion in particular, in the course of time Attend, then, to what he says I cannot see how it can be that an action which seems allowable in speculation should not be so likewise in practice, because what may be done in practice depends on what is found to be lawful in speculation, and the things differ from each other only as cause and effect Speculation is that which determines to action *Whence it follows that opinions probable in speculation may be followed with a safe conscience in practice*, and that even with more safety than those which have not been so well examined as matters of speculation '

Verily, fathers, your friend Escobar reasons uncommonly well sometimes and, in point of fact, there is such a close connection between speculation and practice, that when the former has once taken root, you have no difficulty in permitting the latter, without any disguise A good illustration of this we have in the permission to kill for a buffet, which, from being a point of simple speculation was boldly raised by Lessius into a practice which ought not easily to be allowed ', from that promoted by Escobar to the character of an easy practice , and from thence elevated by your fathers of Caen, as we have seen without any distinction between theory and practice, into a full permission Thus you bring your opinions to their full growth very gradually Were they presented all at once in their finished extravagance, they would beget horror but this slow imperceptible progress gradually habituates men to the sight of them and hides their offensiveness And in this way the permission to murder, in itself so odious both to Church and State, creeps first into the Church, and then from the Church into the State

A similar success has attended the opinion of killing for slander, which has now reached the climax of a permission without any distinction I should not

have stopped to quote my authorities on this point from your writings had it not been necessary in order to put down the effrontery with which you have asserted twice over in your fifteenth *Imposture* that there never was a Jesuit who per mitted killing for slander Before making this statement fathers you should have taken care to prevent it from coming under my notice seeing that it is so easy for me to answer it For not to mention that your fathers Reginald Filiutius and others have permitted it in speculation as I have already shown and that the principle laid down by Escobar leads us safely on to the practice I have to tell you that you have authors who have permitted it in so many words and among others Father Hereau in his public lectures on the conclusion of which the king put him under arrest in your house for having taught among other errors that when a person who has slandered us in the presence of men of honour continues to do so after being warned to desist it is allowable to kill him not publicly, indeed for fear of scandal but *in a private way—sed clam*

I have had occasion already to mention Father Lamy and you do not need to be informed that his doctrine on this subject was censured in 1649 by the Uni versity of Louvain And yet two months have not elapsed since your Father Des Bois maintained this very censured doctrine of Father Lamy and taught that it was allowable for a monk to defend the honour which he acquired by his virtue *even by killing* the person who assails his reputation—*etiam cum morte invasoris* which has raised such a scandal in that town that the whole of the curés united to impose silence on him and to oblige him by a canonical process to retract his doctrine The case is now pending in the Episcopal court

What say you now fathers? Why attempt after that to maintain that no Jesuit ever held that it was lawful to kill for slander? Is anything more nec essary to convince you of this than the very opinions of your fathers which you quote since they do not condemn murder in speculation but only in practice and that too on account of the injury that might thereby accrue to the State ? And here I would just beg to ask whether the whole matter in dispute between us is not simply and solely to ascertain if you have or have not subverted the law of God which condemns murder? The point in question is not whether you have injured the commonwealth but whether you have injured religion What pur pose then can it serve in a dispute of this kind to show that you have spared the State when you make it apparent at the same time that you have destroyed the faith? Is this not evident from your saying that the meaning of Reginald on the question of killing for slanders is that a private individual has a right to employ that mode of defence viewing it simply *in its lf* ? I desire nothing beyond this concession to confute you A private individual you say has a right to employ that mode of defence (that is killing for slanders) viewing the thing in itself and consequently fathers the law of God which forbids us to kill is nullified by that decision

It serves no purpose to add as you have done that such a mode is unlawful and criminal even according to the law of God on account of the murders and disorders which would follow in society because the law of God obliges us to have regard to the good of society This is to evade the question for there are two laws to be observed—one forbidding us to kill and another forbidding us to harm society Reginald has not perhaps broken the law which forbids us to do harm to society but he has most certainly violated that which forbids us to kill

Now this is the only point with which we have to do I might have shown, besides, that your other writers, who have permitted these murders in practice, have subverted the one law as well as the other But, to proceed, we have seen that you *sometimes* forbid doing harm to the State, and you allege that your design in that is to fulfil the law of God, which obliges us to consult the interests of society That may be true, though it is far from being certain, as you might do the same thing purely from fear of the civil magistrate With your permission, then, we shall scrutinize the real secret of this movement

Is it not certain, fathers, that if you had really any regard to God, and if the observance of his law had been the prime and principal object in your thoughts, this respect would have invariably predominated in all your leading decisions and would have engaged you at all times on the side of religion? But, if it turns out, on the contrary, that you violate, in innumerable instances, the most sacred commands that God has laid upon men, and that, as in the instances before us you annihilate the law of God, which forbids these actions as criminal in themselves, and that you only scruple to approve of them in practice, from bodily fear of the civil magistrate, do you not afford us ground to conclude that you have no respect to God in your apprehensions, and that if you yield an apparent obedience to his law, in so far as regards the obligation to do no harm to the State, this is not done out of any regard to the law itself, but to compass your own ends, as has ever been the way with politicians of no religion?

What, fathers! will you tell us that, looking simply to the law of God, which says, Thou shalt not kill, we have a right to kill for slanders? And after having thus trampled on the eternal law of God, do you imagine that you atone for the scandal you have caused, and can persuade us of your reverence for Him, by adding that you prohibit the practice for State reasons and from dread of the civil arm? Is not this, on the contrary, to raise a fresh scandal? I mean not by the respect which you testify for the magistrate, that is not my charge against you, and it is ridiculous in you to banter, as you have done, on this matter I blame you, not for fearing the magistrate, but for fearing none but the magistrate And I blame you for this, because it is making God less the enemy of vice than man Had you said that to kill for slander was allowable according to men, but not according to God, that might have been something more endurable, but when you maintain that what is too criminal to be tolerated among men may yet be innocent and right in the eyes of that Being who is righteousness itself, what is this but to declare before the whole world, by a subversion of principle as shocking in itself as it is alien to the spirit of the saints, that while you can be braggarts before God you are cowards before men?

Had you really been anxious to condemn these homicides, you would have allowed the commandment of God which forbids them to remain intact, and had you dared at once to permit them, you would have permitted them openly, in spite of the laws of God and men But, your object being to permit them imperceptibly, and to cheat the magistrate, who watches over the public safety, you have gone craftily to work. You separate your maxims into two portions On the one side, you hold out "that it is lawful in speculation to kill a man for slander , and nobody thinks of hindering you from taking a speculative view of matters On the other side, you come out with this detached axiom, that what is permitted in speculation is also permissible in practice , and what concern does

society seem to have in this general and metaphysical looking proposition? And thus these two principles so little suspected being embraced in their separate form the vigilance of the magistrate is eluded while it is only necessary to combine the two together to draw from them the conclusion which you aim at—namely that it is lawful in practice to put a man to death for a simple slander

It is indeed fathers one of the most subtle tricks of your policy to scatter through your publications the maxims which you club together in your decisions It is partly in this way that you establish your doctrine of probabilities which I have frequently had occasion to explain That general principle once established you advance propositions harmless enough when viewed apart but which when taken in connection with that pernicious dogma become positively horrible An example of this which demands an answer may be found in the 11th page of your *Impostures* where you allege that several famous theologians have decided that it is lawful to kill a man for a box on the ear Now it is certain that if that had been said by a person who did not hold probabilism there would be nothing to find fault with in it it would in this case amount to no more than a harmless statement and nothing could be elicited from it But you fathers and all who hold that dangerous tenet that whatever has been approved by celebrated authors is probable and safe in conscience when *you* add to this that several celebrated authors are of opinion that it is lawful to kill a man for a box on the ear what is this but to put a dagger into the hand of all Christians for the purpose of plunging it into the heart of the first person that insults them and to assure them that having the judgement of so many grave authors on their side they may do so with a perfectly safe conscience?

What monstrous species of language is this which in announcing that certain authors hold a detestable opinion is at the same time giving a decision in favour of that opinion—which solemnly teaches whatever it simply tells! We have learnt fathers to understand this peculiar dialect of the Jesuitical school and it is astonishing that you have the hardihood to speak it out so freely for it betrays your sentiments somewhat too broadly It convicts you of permitting murder for a buffet as often as you repeat that many celebrated authors have maintained that opinion

This charge fathers you will never be able to repel nor will you be much helped out by those passages from Vasquez and Suarez that you adduce against me in which they condemn the murders which their associates have approved These testimonies disjoined from the rest of your doctrine may hoodwink those who know little about it but we who know better put your principles and maxims together You say then that Vasquez condemns murders but what say you on the other side of the question my reverend fathers? Why that the probability of one sentiment does not hinder the probability of the opposite sentiment and that it is warrantable to follow the less probable and less safe opinion giving up the more probable and more safe one What follows from all this taken in connection but that we have perfect freedom of conscience to adopt any one of these conflicting judgements which pleases us best? And what becomes of all the effect which you fondly anticipate from your quotations? It evaporates in smoke for we have no more to do than to conjoin for your condemnation the maxims which you have disjoined for your exculpation Why then produce those passages of your authors which I have not quoted to qualify those which I have

quoted, as if the one could excuse the other? What right does that give you to call me an "impostor"? Have I said that all your fathers are implicated in the same corruptions? Have I not, on the contrary, been at pains to show that your interest lay in having them of all different minds, in order to suit all your purposes? Do you wish to kill your man?—here is Lessius for you Are you inclined to spare him?—here is Vasquez Nobody need go away in ill humour—nobody without the authority of a grave doctor Lessius will talk to you like a Heathen on homicide, and like a Christian, *it may be, on charity Vasquez, again, will descant like* a Heathen on charity, and like a Christian on homicide But by means of probabilism, which is held both by Vasquez and Lessius, and which renders all your opinions common property, they will lend their opinions to one another, and each will be held bound to absolve those who have acted according to opinions which each of them has condemned It is this very variety, then, that confounds you Uniformity, even in evil, would be better than this Nothing is more contrary to the orders of St Ignatius and the first generals of your Society than this confused medley of all sorts of opinions, good and bad I may, perhaps, enter on this topic at some future period, and it will astonish many to see how far you have degenerated from the original spirit of your institution, and that your own generals have foreseen that the corruption of your doctrine on morals might prove fatal, not only to your Society, but to the Church universal

Meanwhile, I repeat that you can derive no advantage from the doctrine of Vasquez It would be strange, indeed, if, out of all the Jesuits that have written on morals, one or two could not be found who may have hit upon a truth which has been confessed by all Christians There is no glory in maintaining the truth, according to the Gospel, that it is unlawful to kill a man for smiting us on the face, but it is foul shame to deny it So far, indeed, from justifying you, nothing tells more fatally against you than the fact that, having doctors among you who have told you the truth, you abide not in the truth, but love the darkness rather than the light You have been taught by Vasquez that it is a Heathen, and not a Christian, opinion to hold that we may knock down a man for a blow on the cheek, and that it is subversive both of the Gospel and of the Decalogue to say that we may kill for such a matter The most profligate of men will acknowledge as much And yet you have allowed Lessius, Escobar, and others, to decide, in the face of these well known truths, and in spite of all the laws of God against manslaughter, that it is quite allowable to kill a man for a buffet!

What purpose, then, can it serve to set this passage of Vasquez over against the *sentiment of Lessius, unless you mean to show* that, in the opinion of Vasquez, Lessius is a 'Heathen' and a 'profligate'? and that, fathers, is more than I durst have said myself What else can be deduced from it than that Lessius 'subverts both the Gospel and the Decalogue', that, at the last day, Vasquez will condemn Lessius on this point, as Lessius will condemn Vasquez on another, and that all your fathers will rise up in judgement one against another, mutually condemning each other for their sad outrages on the law of Jesus Christ?

To this conclusion, then, reverend fathers, must we come at length, that, as your probabilism renders the good opinions of some of your authors useless to the Church, and useful only to your policy, they merely serve to betray, by their contrariety, the duplicity of your hearts This you have completely unfolded, by telling us, on the one hand, that Vasquez and Suarez are against homicide, and

on the other hand that many celebrated authors are for homicide thus presenting two roads to our choice and destroying the simplicity of the Spirit of God who denounces his anathema on the deceitful and the double hearted *Væ duplici corde et ingredienti duabus viis!*—Woe be to the double hearts and the sinner that goeth two ways!

LETTER XIV

TO THE REVEREND FATHERS THE JESUITS

October 23 1656

REVEREND FATHERS

If I had merely to reply to the three remaining charges on the subject of homicide there would be no need for a long discourse and you will see them refuted presently in a few words but as I think it of much more importance to inspire the public with a horror at your opinions on this subject than to justify the fidelity of my quotations I shall be obliged to devote the greater part of this letter to the refutation of your maxims to show you how far you have departed from the sentiments of the Church and even of nature itself The permissions of murder, which you have granted in such a variety of cases render it very apparent that you have so far forgotten the law of God and quenched the light of nature as to require to be remanded to the simplest principles of religion and of common sense

What can be a plainer dictate of nature than that no private individual has a right to take away the life of another ? So well are we taught this of ourselves says St Chrysostom that God in giving the commandment not to kill did not add as a reason that homicide was an evil because says that father the law supposes that nature has taught us that truth already Accordingly this commandment has been binding on men in all ages The Gospel has confirmed the requirement of the law and the Decalogue only renewed the command which man had received from God before the law in the person of Noah from whom all men are descended On that renovation of the world God said to the patriarch At the hand of man and at the hand of every man s brother will I require the life of man Whoso sheddeth man s blood by man shall his blood be shed for man is made in the image of God (Gen ix 5 6) This general prohibition deprives man of all power over the life of man And so exclusively has the Almighty reserved this prerogative in His own hand that in accordance with Christianity which is at utter variance with the false maxims of Paganism man has no power even over his own life But as it has seemed good to His providence to take human society under His protection and to punish the evil doers that give it disturbance He has Himself established laws for depriving criminals of life and thus those executions which without His sanction would be punishable outrages become by virtue of His authority which is the rule of justice praiseworthy penalties St Augustine takes an admirable view of this subject God he says has himself qualified this general prohibition against manslaughter both by the laws which He has instituted for the capital punishment of malefactors and by the special orders which He has sometimes issued to put to death certain individuals And

when death is inflicted in such cases, it is not man that kills, but God, of whom man may be considered as only the instrument, in the same way as a sword in the hand of him that wields it But, these instances excepted, whosoever kills incurs the guilt of murder

It appears, then, fathers, that the right of taking away the life of man is the sole prerogative of God, and that, having ordained laws for executing death on criminals, He has deputed kings or commonwealths as the depositaries of that power—a truth which St Paul teaches us, when, speaking of the right which sovereigns possess over the lives of their subjects, he deduces it from Heaven in these words He beareth not the sword in vain, for he is the minister of God to execute wrath upon him that doeth evil" (Rom 13 4) But as it is God who has put this power into their hands, so He requires them to exercise it in the same manner as He does himself, in other words, with perfect justice, according to what St Paul observes in the same passage Rulers are not a terror to good works, but to the evil Wilt thou, then, not be afraid of the power? Do that which is good for he is the minister of God to thee for good' And this restriction, so far from lowering their prerogative, exalts it, on the contrary, more than ever, for it is thus assimilated to that of God who has no power to do evil, but is all-powerful to do good, and it is thus distinguished from that of devils, who are impotent in that which is good, and powerful only for evil There is this difference only to be observed betwixt the King of Heaven and earthly sovereigns, that God, being justice and wisdom itself, may inflict death instantaneously on whomsoever and in whatsoever manner He pleases, for, besides His being the sovereign Lord of human life, it is certain that He never takes it away either without cause or without judgement, because He is as incapable of injustice as He is of error Earthly potentates, however, are not at liberty to act in this manner, for, though the ministers of God, still they are but men, and not gods They may be misguided by evil counsels, irritated by false suspicions, transported by passion, and hence they find themselves obliged to have recourse, in their turn also, to human agency, and appoint magistrates in their dominions, to whom they delegate their power, that the authority which God has bestowed on them may be employed solely for the purpose for which they received it

I hope you understand, then, fathers, that, to avoid the crime of murder, we must act at once by the authority of God, and according to the justice of God, and that, when these two conditions are not united, sin is contracted, whether it be by taking away life with his authority, but without his justice, or by taking it away with justice, but without his authority From this indispensable connection it follows, according to St Augustine, that he who, without proper authority, kills a criminal, becomes a criminal himself, chiefly for this reason, that he usurps an authority which God has not given him , and on the other hand, magistrates, though they possess this authority, are nevertheless chargeable with murder, if, contrary to the laws which they are bound to follow, they inflict death on an innocent man

Such are the principles of public safety and tranquillity which have been admitted at all times and in all places, and on the basis of which all legislators, sacred and profane, from the beginning of the world, have founded their laws Even Heathens have never ventured to make an exception to this rule, unless in cases where there was no other way of escaping the loss of chastity or life, when they

conceived as Cicero tells us that the law itself seemed to put its weapons into the hands of those who were placed in such an emergency

But with this single exception which has nothing to do with my present purpose that such a law was ever enacted authorizing or tolerating as you have done the practice of putting a man to death to atone fo an insult or to avoid the loss of honour or property where life is no in danger at the same time that fathers is what I deny was ever done even by infidels They have on the contrary most expressly forbidden the practice The law of the Twelve Tables of Rome bore that it is unlawful to kill a robber in the daytime when he does not defend himself with arms which indeed had been prohibited long before in the 22d chapter of Exodus And the law *Furem* in the *Lex Cornelia* which is borrowed from Ulpian forbids the killing of robbers even by night if they do not put us in danger of our lives

Tell us now fathers what authority you have to permit what all laws human as well as divine have forbidden and who gave Lessius a right to use the following language? The book of Exodus forbids the killing of thieves by day when they do not employ arms in their defence and in a court of justice punishment is inflicted on those who kill under these circumstances *In conscience* however no blame can be attached to this practice when a person is not sure of being able otherwise to recover his stolen goods or entertains a doubt on the subject as Sotus expresses it for he is not obliged to run the risk of losing any part of his property merely to save the life of a robber The same privilege extends even to clergymen Such extraordinary assurance! The law of Moses punishes those who kill a thief when he does not threaten our lives and the law of the Gospel according to you will absolve them! What fathers! has Jesus Christ come to destroy the law and not to fulfil it? The civil judge says Lessius would inflict punishment on those who should kill under such circumstances but no blame can be attached to the deed in conscience Must we conclude then that the morality of Jesus Christ is more sanguinary and less the enemy of murder than that of Pagans from whom our judges have borrowed their civil laws which condemn that crime? Do Christians make more account of the good things of this earth and less account of human life than infidels and idolaters? On what principle do you proceed fathers? Assuredly not upon any law that ever was enacted either by God or man—on nothing indeed but this extraordinary reasoning The laws say you permit us to defend ourselves against robbers and to repel force by force self defence therefore being permitted it follows that murder without which self defence is often impracticable may be considered as permitted also

It is false fathers that because self defence is allowed murder may be allowed also This barbarous method of self vindication lies at the root of all your errors and has been justly stigmatized by the Faculty of Louvain in their censure of the doctrine of your friend Father Lamy as *a murderous defence—defensio occisiva* I maintain that the laws recognize such a wide difference between murder and self defence that in those very cases in which the latter is sanctioned they have made a provision against murder when the person is in no danger of his life Read the words fathers as they run in the same passage of Cujas It is lawful to repulse the person who comes to invade our property but *we are not permitted to kill him* And again If any should threaten to strike us and not to deprive us of life it is quite allowable to repulse him but *it is against all law to put him to death*

Who, then, has given you a right to say, as Molina, Reginald, Filiutius, Escobar, Lessius, and others among you, have said, "that it is lawful to kill the man who offers to strike us a blow ? or, that it is lawful to take the life of one who means to insult us, by the common consent of all the casuists, as Lessius says By what authority do you, who are mere private individuals, confer upon other private individuals, not excepting clergymen, this right of killing and slaying? And how dare you usurp the power of life and death, which belongs essentially to none but God, and which is the most glorious mark of sovereign authority? These are the points that demand explanation, and yet you conceive that you have furnished a triumphant reply to the whole, by simply remarking, in your thirteenth *Imposture*, that the value for which Molina permits us to kill a thief, who flies without having done us any violence, is not so small as I have said, and that it must be a much larger sum than six ducats! ' How extremely silly! Pray, fathers, where would you have the price to be fixed? At fifteen or sixteen ducats? Do not suppose that this will produce any abatement in my accusations At all events, you cannot make it exceed the value of a horse, for Lessius is clearly of opinion, that we may lawfully kill the thief that runs off with our horse " But I must tell you, moreover, that I was perfectly correct when I said that Molina estimates the value of the thief's life at six ducats, and, if you will not take it upon my word, we shall refer it to an umpire to whom you cannot object The person whom I fix upon for this office is your own Father Reginald, who, in his explanation of the same passage of Molina (l 28, n 68), declares that Molina there *determines* the sum for which it is not allowable to kill at three, or four, or five ducats And thus, fathers, I shall have Reginald, in addition to Molina, to bear me out

It will be equally easy for me to refute your fourteenth *Imposture*, touching Molina's permission to kill a thief who offers to rob us of a crown " This palpable fact is attested by Escobar, who tells us that Molina has regularly determined the sum for which it is lawful to take away life, at one crown And all you have to lay to my charge in the fourteenth *Imposture* is, that I have suppressed the last words of this passage, namely, 'that in this matter every one ought to study the moderation of a just self-defence " Why do you not complain that Escobar has also omitted to mention these words? But how little tact you have about you! You imagine that nobody understands what you mean by *self defence* Don't we know that it is to employ *a murderous defence* ? You would persuade us that Molina meant to say that if a person, in defending his crown, finds himself in danger of his life, he is then at liberty to kill his assailant, in self preservation If that were true, fathers, why should Molina say in the same place that in this matter he was of a contrary judgement from Carrer and Bald, who give permission to kill in self-preservation? I repeat, therefore, that his plain meaning is that, provided the person can save his crown without killing the thief, he ought not to kill him, but that, if he cannot secure his object without shedding blood, even though he should run no risk of his own life, as in the case of the robber being unarmed, he is permitted to take up arms and kill the man, in order to save his crown, and in so doing, according to him, the person does not transgress the moderation of a just defence " To show you that I am in the right, just allow him to explain himself 'One does not exceed the moderation of a just defence,' says he, when he takes up arms against a thief who has none, or employs weapons which give him the advantage over his assailant I know there are some who are of a contrary

judgement but I do not approve of their opinion even in the external tribunal

Thus fathers it is unquestionable that your authors have given permission to kill in defence of property and honour though life should be perfectly free from danger And it is upon the same principle that they authorize duelling as I have shown by a great variety of passages from their writings to which you have made no reply You have animadverted in your writings only on a single passage taken from Father Layman who sanctions the above practice when otherwise a person would be in danger of sacrificing his fortune or his honour and here you accuse me with having suppressed what he adds that such a case happens very rarely You astonish me fathers these are really curious impostures you charge me withal You talk as if the question were whether that is a rare case? when the real question is if in such a case duelling is lawful? These are two very different questions Layman in the quality of a casuist ought to judge whether duelling is lawful in the case supposed and he declares that it is We can judge without his assistance whether the case be a rare one and we can tell him that it is a very ordinary one Or if you prefer the testimony of your good friend Diana he will tell you that the case is exceedingly common But be it rare or not and let it be granted that Layman follows in this the example of Navarre a circumstance on which you lay so much stress is it not shameful that he should consent to such an opinion as that to preserve a false honour it is lawful in conscience to accept of a challenge in the face of the edicts of all Christian states and of all the canons of the Church while in support of these diabolical maxims you can produce neither laws nor canons nor authorities from Scripture or from the fathers nor the example of a single saint nor in short anything but the following impious syllogism Honour is more than life it is allowable to kill in defence of life therefore it is allowable to kill in defence of honour! What fathers! because the depravity of men disposes them to prefer that factitious honour before the life which God hath given them to be devoted to his service must they be permitted to murder one another for its preservation? To love that honour more than life is in itself a heinous evil and yet this vicious passion which when proposed as the end of our conduct is enough to tarnish the holiest of actions is considered by you capable of sanctifying the most criminal of them!

What a subversion of all principle is here fathers! And who does not see to what atrocious excesses it may lead? It is obvious indeed that it will ultimately lead to the commission of murder for the most trifling things imaginable when one s honour is considered to be staked for their preservation—murder I venture to say even *for an apple!* You might complain of me fathers for drawing sanguinary inferences from your doctrine with a malicious intent were I not fortunately supported by the authority of the grave Lessius who makes the following observation in number 68 It is not allowable to take life for an article of small value such as for a crown or *for an apple—aut pro pomo*—unless it would be deemed dishonourable to lose it In this case one may recover the article and even if necessary *kill the aggressor* for this is not so much defending one s property as retrieving one s honour This is plain speaking fathers and just to crown your doctrine with a maxim which includes all the rest allow me to quote the following from Father Hereau who has taken it from Lessius The right of self defence extends to whatever is necessary to protect ourselves from all injury

What strange consequences does this inhuman principle involve! and how im

perative is the obligation laid upon all, and especially upon those in public [illegible], to set their face against it! Not the general good alone, but their own [illegible] interest should engage them to see well to it, for the casuists of your [illegible] I have cited in my letters extend their permissions to kill far enough [illegible] them Factious men, who dread the punishment of their outrages, [illegible] appear to them in a criminal light, easily persuade themselves that [illegible] victims of violent oppression, and will be led to believe at the same [illegible] right of self defence extends to whatever is necessary to protect [illegible] all injury " And thus, relieved from contending against the [illegible] which stifle the greater number of crimes at their birth, their only [illegible] to surmount external obstacles

I shall say no more on this subject, fathers, nor shall I [illegible] murders, still more odious and important to governments, [illegible] and of which Lessius, in common with many others of your [illegible] most unreserved manner It was to be wished that [illegible] never found their way out of hell, and that the devil, who is [illegible] had never discovered men sufficiently devoted to his will [illegible] Christians

From all that I have hitherto said, it is easy to judge what a [illegible] betwixt the licentiousness of your opinions and the severity of [illegible] excepting those of Heathens How much more apparent must [illegible] ecclesiastical laws, which must be incomparably more holy than [illegible] is the Church alone that knows and possesses the true [illegible] chaste spouse of the Son of God, who, in imitation of her [illegible] shed her own blood for others, but never the blood of others [illegible] a horror at the crime of murder altogether singular, and [illegible] culiar illumination which God has vouchsafed to bestow [illegible] not simply as man, but as the image of the God whom [illegible] every one of the race a holy respect, which imparts to him [illegible] character, as redeemed by an infinite price, to be made [illegible] God And therefore she considers the death of a man, [illegible] of his Maker, not as murder only, but as sacrilege, by [illegible] of her members, for, whether he be a believer or an [illegible] looks upon him, if not as one, at least as capable of [illegible] children

Such, fathers, are the holy reasons which, ever since [illegible] man for the redemption of men, have rendered their [illegible] consequence to the Church that she uniformly pun[illegible] not only as destructive to them, but as one of the [illegible] sibly be perpetrated against God In proof of this I [illegible] not from the idea that all the severities to which I [illegible] am aware that the Church may alter the arrangement [illegible] but to demonstrate her immutable spirit upon this [illegible] she ordains for murder may differ according to the [illegible] change of time can ever effect an alteration of the [illegible] the crime itself

For a long time the Church refused to be recon[illegible] to those who had been guilty of wilful murder, [illegible]

your sanction The celebrated Council of Ancyra adjudged them to penance during their whole lifetime and subsequently the Church deemed it an act of sufficient indulgence to reduce that term to a great many years But still more effectually to deter Christians from wilful murder she has visited with most severe punishment even those acts which have been committed through inadvertence as may be seen in St Basil in St Gregory of Nyssen and in the decretals of Popes Zachary and Alexander II The canons quoted by Isaac bishop of Langres (tr 2 13) ordain seven years of penance for having killed another in self defence And we find St Hildebert bishop of Mans replying to Yves de Chartres that he was right in interdicting for life a priest who had in self defence killed a robber with a stone

After this you cannot have the assurance to persist in saying that your decisions are agreeable to the spirit or the canons of the Church I defy you to show one of them that permits us to kill solely in defence of our property (for I speak not of cases in which one may be called upon to defend his life—*se suaquae liberando*) your own authors and among the rest Father Lamy confess that no such canon can be found There is no authority he says human or divine which gives an express permission to kill a robber who makes no resistance And yet this is what you permit most expressly I defy you to show one of them that permits us to kill in vindication of honour for a buffet for an affront or for a slander I defy you to show one of them that permits the killing of witnesses judges or magistrates whatever injustice we may apprehend from them The spirit of the church is diametrically opposite to these seditious maxims opening the door to insurrections to which the mob is naturally prone enough already She has invariably taught her children that they ought not to render evil for evil that they ought to give place unto wrath to make no resistance to violence to give unto every one his due—honour tribute submission to obey magistrates and superiors even though they should be unjust because we ought always to respect in them the power of that God who has placed them over us She forbids them still more strongly than is done by the civil law to take justice into their own hands and it is in her spirit that Christian kings decline doing so in cases of high treason and remit the criminals charged with this grave offence into the hands of the judges that they may be punished according to the laws and the forms of justice which in this matter exhibit a contrast to your mode of management so striking and complete that it may well make you blush for shame

As my discourse has taken this turn I beg you to follow the comparison which I shall now draw between the style in which you would dispose of your enemies and that in which the judges of the land dispose of criminals Everybody knows fathers that no private individual has a right to demand the death of another individual and that though a man should have ruined us maimed our body burnt our house murdered our father and was prepared moreover to assassinate ourselves or ruin our character our private demand for the death of that person would not be listened to in a court of justice Public officers have been appointed for that purpose who make the demand in the name of the king or rather I would say in the name of God Now do you conceive fathers that Christian legislators have established this regulation out of mere show and grimace? Is it not evident that their object was to harmonize the laws of the state with those of the Church and thus prevent the external practice of justice from clashing with

the sentiments which all Christians are bound to cherish in their hearts? It is easy to see how this, which forms the commencement of a civil process, must stagger you, its subsequent procedure absolutely overwhelms you

Suppose then, fathers, that these official persons have demanded the death of the man who has committed all the above mentioned crimes, what is to be done next? Will they instantly plunge a dagger in his breast? No, fathers, the life of man *is too important to be thus disposed of, they go to work with more decency, the laws have committed it, not to all sorts of persons, but exclusively to the judges,* whose probity and competency have been duly tried And is one judge sufficient to condemn a man to death? No, it requires seven at the very least, and of these seven there must not be one who has been injured by the criminal, lest his judgement should be warped or corrupted by passion You are aware also, fathers, that, the more effectually to secure the purity of their minds, they devote the hours of the morning to these functions Such is the care taken to prepare them for the solemn action of devoting a fellow creature to death, in performing which they occupy the place of God, whose ministers they are, appointed to condemn such only as have incurred his condemnation

For the same reason, to act as faithful administrators of the divine power of taking away human life, they are bound to form their judgement solely according to the depositions of the witnesses, and according to all the other forms prescribed to them, after which they can pronounce conscientiously only according to law, and can judge worthy of death those only whom the law condemns to that penalty And then, fathers, if the command of God obliges them to deliver over to punishment the bodies of the unhappy culprits, the same divine statute binds them to look after the interests of their guilty souls, and binds them the more to this just because they are guilty, so that they are not delivered up to execution till after they have been afforded the means of providing for their consciences *All* this is quite fair and innocent, and yet, such is *the abhorrence of the Church to* blood that she judges those to be incapable of ministering at her altars who have borne any share in passing or executing a sentence of death, accompanied though it be with these religious circumstances, from which we may easily conceive what idea the Church entertains of murder

Such, then, being the manner in which human life is disposed of by the legal forms of justice, let us now see how you dispose of it According to your modern system of legislation, there is but one judge, and that judge is no other than the offended party He is at once the judge, the party, and the executioner He himself demands from himself the death of his enemy, he condemns him, he executes him on the spot, and, without *the least respect* either for the soul or the body of his brother, he murders and damns him for whom Jesus Christ died, and all this for the sake of avoiding a blow on the cheek, or a slander, or an offensive word, or some other offence of a similar nature, for which, if a magistrate, in the exercise of legitimate authority, were condemning any to die, he would himself be impeached, for, in such cases, the laws are very far indeed from condemning any to death In one word, to crown the whole of this extravagance, the person who kills his neighbour in this style, without authority and in the face of all law, contracts no sin and commits no disorder, though he should be religious and even a priest! Where are we, fathers? *Are these really* religious, and priests, who talk in this manner? Are they Christians? *are they* Turks? are they men? or are they demons? And are these

the mysteries revealed by the Lamb to his Society ? or are they not rather abominations suggested by the Dragon to those who take part with him?

To come to the point with you fathers whom do you wish to be taken for?—for the children of the Gospel or for the enemies of the Gospel? You must be ranged either on the one side or on the other for there is no medium here He that is not with Jesus Christ is against him Into these two classes all mankind are divided There are according to St Augustine two peoples and two worlds scattered abroad over the earth There is the world of the children of God who form one body of which Jesus Christ is the king and the head and there is the world at enmity with God of which the devil is the king and the head Hence Jesus Christ is called the King and God of the world because he has everywhere his subjects and worshippers and hence the devil is also termed in Scripture the *prince* of this world and the god of this world because he has everywhere his agents and his slaves Jesus Christ has imposed upon the Church which is his empire such laws as he in his eternal wisdom was pleased to ordain and the devil has imposed on the world which is his kingdom such laws as he chose to establish Jesus Christ has associated honour with suffering the devil with not suffering Jesus Christ has told those who are smitten on the one cheek to turn the other also and the devil has told those who are threatened with a buffet to kill the man that would do them such an injury Jesus Christ pronounces those happy who share in his reproach and the devil declares those to be unhappy who lie under ignominy Jesus Christ says Woe unto you when men shall speak well of you! and the devil says Woe unto those of whom the world does not speak with esteem!

Judge then fathers to which of these kingdoms you belong You have heard the language of the city of peace the mystical Jerusalem and you have heard the language of the city of confusion which Scripture terms the spiritual Sodom Which of these two languages do you understand? which of them do you speak? Those who are on the side of Jesus Christ have as St Paul teaches us the same mind which was also in him and those who are the children of the devil—*ex patre diabolo*—who has been a murderer from the beginning according to the saying of Jesus Christ follow the maxims of the devil Let us hear therefore the language of your school I put this question to your doctors When a person has given me a blow on the cheek ought I rather to submit to the injury than kill the offender? or may I not kill the man in order to escape the affront? Kill him by all means—it is quite lawful! exclaim in one breath Lessius Molina Escobar Reginald Filiutius *Baldelle* and other Jesuits Is that the language of Jesus Christ? One question more Would I lose my honour by tolerating a box on the ear without killing the person that gave it? Can there be a doubt cries Escobar that so long as a man suffers another to live who has given him a buffet that man remains without honour? Yes fathers without that honour which the devil transfuses from his own proud spirit into that of his proud children This is the honour which has ever been the idol of worldly minded men For the preservation of this false glory of which the god of this world is the appropriate dispenser they sacrifice their lives by yielding to the madness of duelling their honour by exposing themselves to ignominious punishments and their salvation by involving themselves in the peril of damnation—a peril which according to the canons of the Church deprives them even of Christian burial We have reason to thank God however for

having enlightened the mind of our monarch with ideas much purer than those of your theology His edicts bearing so severely on this subject, have not made duelling a crime—they only punish the crime which is inseparable from duelling He has checked, by the dread of his rigid justice, those who were not restrained by the fear of the justice of God, and his piety has taught him that the honour of Christians consists in their observance of the mandates of Heaven and the rules of Christianity, and not in the pursuit of that phantom which, airy and unsubstantial as it is, you hold to be a legitimate apology for murder Your murderous decisions being thus universally detested, it is highly advisable that you should now change your sentiments, if not from religious principle, at least from motives of policy Prevent, fathers, by a spontaneous condemnation of these inhuman dogmas, the melancholy consequences which may result from them, and for which you will be responsible And to impress your minds with a deeper horror at homicide, remember that the first crime of fallen man was a murder, committed on the person of the first holy man, that the greatest crime was a murder, perpetrated on the person of the King of saints, and that, of all crimes, murder is the only one which involves in a common destruction the Church and the state, nature and religion

I have just seen the answer of your apologist to my *Thirteenth Letter,* but if he has nothing better to produce in the shape of a reply to that letter, which obviates the greater part of his objections, he will not deserve a rejoinder I am sorry to see him perpetually digressing from his subject, to indulge in rancorous abuse both of the living and the dead But, in order to gain some credit to the stories with which you have furnished him, you should not have made him publicly disavow a fact so notorious as that of the buffet of Compiegne Certain it is, fathers, from the deposition of the injured party, that he received upon his cheek a blow from the hand of a Jesuit, and all that your friends have been able to do for you has been to raise a doubt whether he received the blow with the back or the palm of the hand, and to discuss the question whether a stroke on the cheek with the back of the hand can be properly denominated a *buffet* I know not to what tribunal it belongs to decide this point, but shall content myself, in the meantime, with believing that it was, to say the very least, *a probable buffet* This gets me off with a safe conscience

LETTER XV

TO THE REVEREND FATHERS, THE JESUITS

November 25, 1656

REVEREND FATHERS,

As your scurrilities are daily increasing, and as you are employing them in the merciless abuse of all pious persons opposed to your errors, I feel myself obliged, for their sake and that of the Church, to bring out that grand secret of your policy, which I promised to disclose some time ago, in order that all may know, through means of your own maxims, what degree of credit is due to your calumnious accusations

I am aware that those who are not very well acquainted with you are at a great

loss what to think on this subject as they find themselves under the painful necessity either of believing the incredible crimes with which you charge your opponents or (what is equally incredible) of setting you down as slanderers Indeed! they exclaim were these things not true would clergymen publish them to the world—would they debauch their consciences and damn themselves by venting such libels? Such is their way of reasoning and thus it is that the palpable proof of your falsifications coming into collision with their opinion of your honesty their minds hang in a state of suspense between the evidence of truth which they cannot gainsay and the demands of charity which they would not violate It follows that since their high esteem for you is the only thing that prevents them from discrediting your calumnies if we can succeed in convincing them that you have quite a different idea of calumny from that which they suppose you to have and that you actually believe that in blackening and defaming your adversaries you are working out your own salvation there can be little question that the weight of truth will determine them immediately to pay no regard to your accusations This fathers will be the subject of the present letter

My design is not simply to show that your writings are full of calumnies I mean to go a step beyond this It is quite possible for a person to say a number of false things believing them to be true but the character of a liar implies the intention to tell lies Now I undertake to prove fathers that it is your deliberate intention to tell lies and that it is both knowingly and purposely that you load your opponents with crimes of which you know them to be innocent because you believe that you may do so without falling from a state of grace Though you doubtless know this point of your morality as well as I do this need not prevent me from telling you about it which I shall do were it for no other purpose than to convince all men of its existence by showing them that I can maintain it to your face while you cannot have the assurance to disavow it without confirming by that very disavowment the charge which I bring against you

The doctrine to which I allude is so common in your schools that you have maintained it not only in your books but such is your assurance even in your public theses as for example in those delivered at Louvain in the year 1645 where it occurs in the following terms What is it but a venial sin to culminate and forge false accusations to ruin the credit of those who speak evil of us? So settled is this point among you that if any one dare to oppose it you treat him as a blockhead and a hare brained idiot Such was the way in which you treated Father Quiroga the German Capuchin when he was so unfortunate as to impugn the doctrine The poor man was instantly attacked by Dicastille one of your fraternity and the following is a specimen of the manner in which he manages the dispute A certain rueful visaged bare footed cowled friar—*cucullatus gymnopoda*—whom I do not choose to name had the boldness to denounce this opinion among some women and ignorant people and to allege that it was scandalous and pernicious against all good manners hostile to the peace of states and societies and in short contrary to the judgement not only of all Catholic doctors but of all true Catholics But in opposition to him I maintained as I do still that calumny when employed against a calumniator though it should be a falsehood is not a mortal sin either against justice or charity and to prove the point I referred him to the whole body of our fathers and to whole universities exclusively composed of them whom I had consulted on the subject and among

others the reverend Father John Gans, confessor to the Emperor, the reverend Father Daniel Bastele, confessor to the Archduke Leopold, Father Henri, who was preceptor to these two princes, all the public and ordinary professors of the university of Vienna" (wholly composed of Jesuits), all the professors of the university of Gratz' (all Jesuits), all the professors of the university of Prague" (where Jesuits are the masters),—' from all of whom I have in my possession approbations of my opinions, written and signed with their own hands, besides having on my side the reverend Father Panalossa, a Jesuit, preacher to the Emperor and the King of Spain, Father Pilliceroli, a Jesuit, and many others, who had all judged this opinion to be probable, before our dispute began You perceive, fathers, that there are few of your opinions which you have been at more pains to establish than the present, as indeed there were few of them of which you stood more in need For this reason, doubtless, you have authenticated it so well that the casuists appeal to it as an indubitable principle There can be no doubt, says Caramuel, 'that it is a probable opinion that we contract no mortal sin by calumniating another, in order to preserve our own reputation For it is maintained by more than twenty grave doctors, by Gaspard Hurtado, and Dicastille, Jesuits, &c , so that, were this doctrine not probable, it would be difficult to find any one such in the whole compass of theology '

Wretched indeed must that theology be, and rotten to the very core, which, unless it has been decided to be safe in conscience to defame our neighbor s character to preserve our own, can hardly boast of a safe decision on any other point! How natural is it, fathers, that those who hold this principle should occasionally put it in practice! The corrupt propensity of mankind leans so strongly in that direction of itself that, the obstacle of conscience once being removed, it would be folly to suppose that it will not burst forth with all its native impetuosity If you desire an example of this, Caramuel will furnish you with one that occurs in the same passage This maxim of Father Dicastille, he says, having been communicated by a German countess to the daughters of the Empress, the belief thus impressed on their minds that calumny was only a venial sin, gave rise in the course of a few days to such an immense number of false and scandalous tales that the whole court was thrown into a flame and filled with alarm It is easy, indeed, to conceive what a fine use these ladies would make of the new light they had acquired Matters proceeded to such a length, that it was found necessary to call in the assistance of a worthy Capuchin friar, a man of exemplary life, called Father Quiroga (the very man whom Dicastille rails at so bitterly), who assured them that the maxim was most pernicious, especially among women and was at the greatest pains to prevail upon the Empress to abolish the practice of it entirely We have no reason, therefore, to be surprised at the bad effects of this doctrine, on the contrary, the wonder would be if it had failed to produce them Self love is always ready enough to whisper in our ear, when we are attacked, that we suffer wrongfully, and more particularly in your case, fathers, whom vanity has blinded so egregiously as to make you believe that to wound the honour of your Society is to wound that of the Church There would have been good ground to look on it as something miraculous, if you had *not* reduced this maxim to practice Those who do not know you are ready to say How could these good fathers slander their enemies when they cannot do so but at the expense of their own salvation? But, if they knew you better, the question would be How could

these good fathers forego the advantage of decrying their enemies when they have it in their power to do so without hazarding their salvation? Let none therefore henceforth be surprised to find the Jesuits calumniators they can exercise this vocation with a safe conscience there is no obstacle in heaven or on earth to prevent them In virtue of the credit they have acquired in the world they can practise defamation without dreading the justice of mortals and on the strength of their self assumed authority in matters of conscience they have invented maxims for enabling them to do it without any fear of the justice of God

This fathers is the fertile source of your base slanders On this principle was Father Brisacier led to scatter his calumnies about him with such zeal as to draw down on his head the censure of the late Archbishop of Paris Actuated by the same motives Father D Anjou launched his invectives from the pulpit of the Church of St Benedict in Paris on the 8th of March 1655 against those honourable gentlemen who were intrusted with the charitable funds raised for the poor of Picardy and Champagne to which they themselves had largely contributed and uttering a base falsehood calculated (if your slanders had been considered worthy of any credit) to dry up the stream of that charity he had the assurance to say that he knew from good authority that certain persons had diverted that money from its proper use to employ it against the Church and the State a calumny which obliged the curate of the parish who is a doctor of the Sorbonne to mount the pulpit the very next day in order to give it the lie direct To the same source must be traced the conduct of your Father Crasset who preached calumny at such a furious rate in Orleans that the Archbishop of that place was under the necessity of interdicting him as a public slanderer In this mandate dated the 9th of September last his lordship declares That whereas he had been informed that Brother Jean Crasset priest of the Society of Jesus had delivered from the pulpit a discourse filled with falsehoods and calumnies against the ecclesiastics of this city falsely and maliciously charging them with maintaining impious and heretical propositions such as That the commandments of God are impracticable that internal grace is irresistible that Jesus Christ did not die for all men and others of a similar kind condemned by Innocent X he therefore hereby interdicts the aforesaid Crasset from preaching in his diocese and forbids all his people to hear him on pain of mortal disobedience The above fathers, is your ordinary accusation and generally among the first that you bring against all whom it is your interest to denounce And although you should find it as impossible to substantiate the charge against any of them as Father Crasset did in the case of the clergy of Orleans your peace of conscience will not be in the least disturbed on that account for you believe that this mode of calumniating your adversaries is permitted you with such certainty that you have no scruple to avow it in the most public manner and in the face of a whole city

A remarkable proof of this may be seen in the dispute you had with M Puys curate of St Nisier at Lyons and the story exhibits so complete an illustration of your spirit that I shall take the liberty of relating some of its leading circumstances You know fathers that in the year 1649 M Puys translated into French an excellent book written by another Capuchin friar *On the duty which Christians owe to their own parishes against those that would lead them away from them* without using a single invective or pointing to any monk or any order of monks in particular Your fathers however were pleased to put the cap on their own heads

and without any respect to an aged pastor, a judge in the Primacy of France, and a man who was held in the highest esteem by the whole city, Father Alby wrote a furious tract against him, which you sold in your own church upon Assumption Day, in which book, among other various charges, he accused him of having made himself scandalous by his gallantries, described him as suspected of having no religion, as a heretic, excommunicated, and, in short, worthy of the stake To this M Puys made a reply, and Father Alby, in a second publication, supported his former allegations Now, fathers, is it not a clear point either that you were calumniators, or that you believed all that you alleged against that worthy priest to be true, and that, on this latter assumption, it became you to see him purified from all these abominations before judging him worthy of your friendship? Let us see, then, what happened at the accommodation of the dispute, which took place in the presence of a great number of the principal inhabitants of the town on the 25th of September, 1650 Before all these witnesses M Puys made a declaration, which was neither more nor less than this That what he had written was not directed against the fathers of the Society of Jesus, that he had spoken in general of those who alienated the faithful from their parishes, without meaning by that to attack the Society, and that, so far from having such an intention, the Society was the object of his esteem and affection By virtue of these words alone, without either retraction or absolution, M Puys recovered, all at once, from his apostasy, his scandals, and his excommunication, and Father Alby immediately thereafter addressed him in the following express terms Sir, it was in consequence of my believing that you meant to attack the Society to which I have the honour to belong that I was induced to take up the pen in its defence, and I considered that the mode of reply which I adopted was *such as I was permitted to employ* But, on a better understanding of your intention, I am now free to declare that *there is nothing in your work* to prevent me from regarding you as a man of genius, enlightened in judgement, profound and *orthodox* in doctrine, and *irreproachable* in manners, in one word, as a pastor worthy of your Church It is with much pleasure that I make this declaration, and I beg these gentlemen to remember what I have now said"

They do remember it, fathers, and, allow me to add, they were more scandalized by the reconciliation than by the quarrel For who can fail to admire this speech of Father Alby? He does not say that he retracts, in consequence of having learnt that a change had taken place in the faith and manners of M Puys, but solely because, *having understood that he had no intention of attacking your Society*, there was nothing further to prevent him from regarding the author as a good Catholic He did not then believe him to be actually a heretic! And yet, after having, contrary to his conviction, accused him of this crime, he will not acknowledge he was in the wrong, but has the hardihood to say that he considered the method he adopted to be such as he was *permitted* to employ!

What can you possibly mean, fathers, by so publicly avowing the fact that you measure the faith and the virtue of men only by the sentiments they entertain towards your Society? Had you no apprehension of making yourselves pass, by your own acknowledgement, as a band of swindlers and slanderers? What, fathers! must the same individual without undergoing any personal transformation, but simply according as you judge him to have honoured or assailed your community, be pious or impious, irreproachable or excommunicated, a pastor

worthy of the Church or worthy of the stake in short a Catholic or a heretic ? To attack your Society and to be a heretic are therefore in your language convertible terms! An odd sort of heresy this fathers! And so it would appear that when we see many good Catholics branded in your writings by the name of *heretics* it means nothing more than that *you think they attack you!* It is well fathers that we understand this strange dialect according to which there can be no doubt that I must be a great heretic It is in *this* sense then that you so often favour me with this appellation! Your sole reason for cutting me off from the Church is because you conceive that my letters have done you harm and accordingly all that I have to do in order to become a good Catholic is either to approve of your extravagant morality or to convince you that my sole aim in exposing it has been your advantage The former I could not do without renouncing every sentiment of piety that I ever possessed and the latter you will be slow to acknowledge till you are well cured of your errors Thus am I involved in heresy after a very singular fashion for the purity of my faith being of no avail for my exculpation I have no means of escaping from the charge except either by turning traitor to my own conscience or by reforming yours Till one or other of these events happen I must remain a reprobate and a slanderer and let me be ever so faithful in my citations from your writings you will go about crying everywhere What an instrument of the devil must that man be to impute to us things of which there is not the least mark or vestige to be found in our books! And by doing so you will only be acting in conformity with your fixed maxim and your ordinary practice to such latitude does your privilege of telling lies extend! Allow me to give you an example of this which I select on purpose it will give me an opportunity of replying at the same time to your ninth *Imposture* for in truth they only deserve to be refuted in passing

About ten or twelve years ago you were accused of holding that maxim of Father Bauny that it is permissible to seek directly (*primo et per se*) a proximate occasion of sin for the spiritual or temporal good of ourselves or our neighbour (tr 4 q 14) as an example of which he observes It is allowable to visit infamous places for the purpose of converting abandoned females even although the practice should be very likely to lead into sin as in the case of one who has found from experience that he has frequently yielded to their temptations What answer did your Father Caussin give to this charge in the year 1644? Just let any one look at the passage in Father Bauny said he let him peruse the page the margins the preface the appendix in short the whole book from beginning to end and he will not discover the slightest vestige of such a sentence which could only enter into the mind of a man totally devoid of conscience and could hardly have been forged by any other but an instrument of Satan Father Pintereau talks in the same style That man must be lost to all conscience who would teach so detestable a doctrine but he must be worse than a devil who attributes it to Father Bauny Reader there is not a single trace or vestige of it in the whole of his book Who would not believe that persons talking in this tone have good reason to complain and that Father Bauny has in very deed been misrepresented? Have you ever asserted anything against me in stronger terms? And after such a solemn asseveration that there was not a single trace or vestige of it in the whole book who would imagine that the passage is to be found word for word in the place referred to?

Truly, fathers, if this be the means of securing your reputation, so long as you remain unanswered, it is also, unfortunately, the means of destroying it forever, so soon as an answer makes its appearance For so certain is it that you told a lie at the period before mentioned, that you make no scruple of acknowledging, in your apologies of the present day, that the maxim in question is to be found in the very place which had been quoted, and, what is most extraordinary, the same maxim which, twelve years ago, was detestable, has now become so innocent that in your ninth *Imposture* (p 10) you accuse me of ' ignorance and malice, in quarrelling with Father Bauny for an opinion which has not been rejected in the School What an advantage it is, fathers, to have to do with people that deal in contradictions! I need not the aid of any but yourselves to confute you, for I have only two things to show first, That the maxim in dispute is a worthless one, and, secondly, That it belongs to Father Bauny, and I can prove both by your own confession In 1644, you confessed that it was detestable , and, in 1656, you avow that it is Father Bauny s This double acknowledgement completely justifies me, fathers, but it does more, it discovers the spirit of your policy For, tell me, pray, what is the end you propose to yourselves in your writings? Is it to speak with honesty? No, fathers, that cannot be, since your defences destroy each other Is it to follow the truth of the faith? As little can this be your end, since, according to your own showing, you authorize a ' detestable maxim But, be it observed that while you said the maxim was detestable,' you denied, at the same time, that it was the property of Father Bauny, and so he was innocent, and when you now acknowledge it to be his, you maintain, at the same time, that it is a good maxim, and so he is innocent still The innocence of this monk therefore, being the only thing common to your two answers, it is obvious that this was the sole end which you aimed at in putting them forth, and that when you say of one and the same maxim, that it is in a certain book, and that it is not, that it is a good maxim, and that it is a bad one, your sole object is to whitewash some one or other of your fraternity, judging in the matter, not according to the truth, which never changes, but according to your own interest, which is varying every hour Can I say more than this? You perceive that it amounts to a demonstration, but it is far from being a singular instance, and, to omit a multitude of examples of the same thing, I believe you will be contented with my quoting only one more

You have been charged, at different times, with another proposition of the same Father Bauny, namely That absolution ought to be neither denied nor deferred in the case of those who live in the habits of sin against the law of God, of nature, and of the Church, although there should be no apparent prospect of future amendment—*etsi emendationis futuræ spes nulla appareat* Now, with regard to this maxim, I beg you to tell me, fathers, which of the apologies that have been made for it is most to your liking, whether that of Father Pintereau, or that of Father Brisacier, both of your Society, who have defended Father Bauny, in your *two different* modes—the one by condemning the proposition, but disavowing it to be Father Bauny s, the other by allowing it to be Father Bauny s, but vindicating the proposition? Listen, then, to their respective deliverances Here comes that of Father Pintereau (p 8) I know not what can be called a transgression of all the bounds of modesty, a step beyond all ordinary impudence, if the imputation to Father Bauny of so damnable a doctrine is not worthy of that designation Judge, reader, of the baseness of that calumny, see what sort of creatures the

Jesuits have to deal with and say if the author of so foul a slander does not deserve to be regarded from henceforth as the interpreter of the father of lies Now for Father Brisacier It is true Father Bauny says what you allege (That gives the lie direct to Father Pintereau plain enough) But adds he in defence of Father Bauny if you who find so much fault with this sentiment wait when a penitent lies at your feet till his guardian angel find security for his rights in the inheritance of heaven if you wait till God the Father swear by himself that David told a lie when he said by the Holy Ghost that all men are liars fallible and perfidious if you wait till the penitent be no longer a liar no longer frail and changeable no longer a sinner like other men if you wait I say till then you will never apply the blood of Jesus Christ to a single soul

What do you really think now fathers of these impious and extravagant expressions? According to them if we would wait till there be some hope of amendment in sinners before granting their absolution we must wait till God the Father swear by himself that they will never fall into sin any more! What fathers! is no distinction to be made between *hope* and *certainty?* How injurious is it to the grace of Jesus Christ to maintain that it is so impossible for Christians ever to escape from crimes against the laws of God nature and the Church that such a thing cannot be looked for without supposing that the Holy Ghost has told a lie and if absolution is not granted to those who give no hope of amendment the blood of Jesus Christ will be useless forsooth and would never be applied to a single soul! To what a sad pass have you come fathers by this extravagant desire of upholding the glory of your authors when you can find only two ways of justifying them—by imposture or by impiety and when the most innocent mode by which you can extricate yourselves is by the barefaced denial of facts as patent as the light of day!

This may perhaps account for your having recourse so frequently to that very convenient practice But this does not complete the sum of your accomplishments in the art of self defence To render your opponents odious you have had recourse to the forging of documents such as that *Letter of a Minister to M Arnauld* which you circulated through all Paris to induce the belief that the work on *Frequent Communion* which had been approved by so many bishops and doctors but which to say the truth was rather against you had been concocted through secret intelligence with the ministers of Charenton At other times you attribute to your adversaries writings full of impiety such as the *Circular Letter of the Jansenists* the absurd style of which renders the fraud too gross to be swallowed and palpably betrays the malice of your Father Meynier who has the impudence to make use of it for supporting his foulest slanders Sometimes again you will quote books which were never in existence such as *The Constitution of the Holy Sacrament* from which you extract passages fabricated at pleasure and calculated to make the hair on the heads of certain good simple people who have no idea of the effrontery with which you can invent and propagate falsehoods actually to bristle with horror There is not indeed a single species of calumny which you have not put into requisition nor is it possible that the maxim which excuses the vice could have been lodged in better hands

But those sorts of slander to which we have adverted are rather too easily discredited and accordingly you have others of a more subtle character in which you abstain from specifying particulars in order to preclude your opponents from

getting any hold, or finding any means of reply, as, for example, when Father Brisacier says that 'his enemies are guilty of abominable crimes, *which he does not choose to mention* " Would you not think it were impossible to prove a charge so vague as this to be a calumny? An able man, however, has found out the secret of it, and it is a Capuchin again, fathers You are unlucky in Capuchins, as times now go, and I foresee that you may be equally so some other time in Benedictines The name of this Capuchin is Father Valerien, of the house of the Counts of Magnis You shall hear, by this brief narrative, how he answered your calumnies He had happily succeeded in converting Prince Ernest, the Landgrave of Hesse-Rheinsfelt Your fathers, however, seized, as it would appear, with some chagrin at seeing a sovereign prince converted without their having had any hand in it, immediately wrote a book against the friar (for good men are everywhere the objects of your persecution), in which, by falsifying one of his passages, they ascribed to him an heretical doctrine They also circulated a letter against him, in which they said 'Ah, we have such things to disclose" (without mentioning what) ' as will gall you to the quick! If you don t take care, we shall be forced to inform the pope and the cardinals about it " This manœuvre was pretty well executed, and I doubt not, fathers, but you may speak in the same style of me, but take warning from the manner in which the friar answered in his book, which was printed last year at Prague (p 112, &c) What shall I do,' he says, to counteract these vague and indefinite insinuations? How shall I refute charges which have never been specified? Here, however, is my plan I declare, loudly and publicly, to those who have threatened me, that they are notorious slanderers and most impudent liars, if they do not discover these crimes before the whole world Come forth, then, mine accusers! and publish your lies upon the house tops, in place of telling them in the ear, and keeping yourselves out of harm s way by telling them in the ear Some may think this a scandalous way of managing the dispute It was scandalous, I grant, to impute to me such a crime as heresy, and to fix upon me the suspicion of many others besides, but, by asserting my innocence, I am merely applying the proper remedy to the scandal already in existence '

Truly, fathers, never were your reverences more roughly handled, and never was a poor man more completely vindicated Since you have made no reply to such a peremptory challenge, it must be concluded that you are unable to discover the slightest shadow of criminality against him You have had very awkward scrapes to get through occasionally, but experience has made you nothing the wiser For, some time after this happened, you attacked the same individual in a similar strain, upon another subject, and he defended himself after the same spirited manner, as follows ' This class of men, who have become an intolerable nuisance to the whole of Christendom, aspire, under the pretext of good works, to dignities and domination, by perverting to their own ends almost all laws, human and divine, natural and revealed They gain over to their side, by their doctrine, by the force of fear, or of persuasion, the great ones of the earth, whose authority they abuse for the purpose of accomplishing their detestable intrigues Meanwhile their enterprises, criminal as they are, are neither punished nor suppressed, on the contrary, they are rewarded, and the villains go about them with as little fear or remorse as if they were doing God service Everybody is aware of the fact I have now stated, everybody speaks of it with execration, but few are found capable of opposing a despotism so powerful This, however, is what I

have done I have already curbed their insolence and by the same means I shall curb it again I declare then that *they are most impudent liars—mentiris impud ntis sime* If the charges they have brought against me be true let them prove it otherwise they stand convicted of falsehood aggravated by the grossest effron tery Their procedure in this case will show who has the right upon his side I desire all men to take a particular observation of it and beg to remark in the meantime that this precious cabal who will not suffer the most trifling charge which they can possibly repel to lie upon them made a show of enduring with great patience those from which they cannot vindicate themselves and conceal under a counterfeit virtue their real impotency My object therefore in provok ing their modesty by this sharp retort is to let the plainest people understand that if my enemies hold their peace their forbearance must be ascribed not to the meekness of their natures but to the power of a guilty conscience He con cludes with the following sentence These gentry whose history is well known throughout the whole world are so glaringly iniquitous in their measures and have become so insolent in their impunity that if I did not detest their conduct and publicly express my detestation too not merely for my own vindication but to guard the simple against its seducing influence I must have renounced my allegiance to Jesus Christ and his Church

Reverend fathers there is no room for tergiversation You must pass for con victed slanderers and take comfort in your old maxim that calumny is no crime This honest friar has discovered the ecret of shutting your mouths and it must be employed on all occasions when you accuse people without proof We have only to reply to each slander as it appears in the words of the Capuchin *Mentiris impudentissime*—You are most impudent liars For instance what better answer does Father Brisacier deserve when he says of his opponents that they are the gates of hell the devil s bishops persons devoid of faith hope and charity the builders of Antichrist s exchequer adding I say this of him not by way of insult but from deep conviction of its truth ? Who would be at the pains to demonstrate that he is not a gate of hell and that he has no concern with the building up of Antichrist s exchequer ?

In like manner what reply is due to all the vague speeches of this sort which are to be found in your books and advertisements on my letters such as the following for example That restitutions have been converted to private uses and thereby creditors have been reduced to beggary that bags of money have been offered to learned monks who declined the bribe that benefices are con ferred for the purpose of disseminating heresies against the faith that pensioners are kept in the houses of the most eminent churchmen and in the courts of sovereigns that I also am a pensioner of Port Royal and that before writing my letters I had composed *romances* —I who never read one in my life and who do not know so much as the names of those which your apologist has published? What can be said in reply to all this fathers if you do not mention the names of all these persons you refer to their words the time and the place except—*Mentiris impudentissime?* You should either be silent altogether or relate and prove all the circumstances as I did when I told you the anecdotes of Father Alby and John d Alba Otherwise you will hurt none but yourselves Your numerous fables might perhaps have done you some service before your principles were known but now that the whole has been brought to light when you begin to whisper as

usual, 'A man of honor, who desired us to conceal his name, has told us some horrible stories of these same people'—you will be cut short at once, and reminded of the Capuchin's *Mentiris impudentissime.* Too long by far have you been permitted to deceive the world, and to abuse the confidence which men were ready to place in your calumnious accusations. It is high time to redeem the reputation of the multitudes whom you have defamed. For what innocence can be so generally known, as not to suffer some injury from the daring aspersions of a body of men scattered over the face of the earth, and who, under religious habits, conceal minds so utterly irreligious that they perpetrate crimes like calumny, not in opposition to, but in strict accordance with, their moral maxims? I cannot, therefore, be blamed for destroying the credit which might have been awarded you, seeing it must be allowed to be a much greater act of justice to restore to the victims of your obloquy the character which they did not deserve to lose, than to leave you in the possession of a reputation for sincerity which you do not deserve to enjoy. And, as the one could not be done without the other, how important was it to show you up to the world as you really are! In this letter I have commenced the exhibition, but it will require some time to complete it. Published it shall be, fathers, and all your policy will be inadequate to save you from the disgrace, for the efforts which you may make to avert the blow will only serve to convince the most obtuse observers that you were terrified out of your wits, and that, your consciences anticipating the charges I had to bring against you, you have put every oar in the water to prevent the discovery.

LETTER XVI

To the Reverend Fathers, the Jesuits

December 4, 1656

Reverend Fathers,

I now come to consider the rest of your calumnies, and shall begin with those contained in your advertisements, which remain to be noticed. As all your other writings, however, are equally well stocked with slander, they will furnish me with abundant materials for entertaining you on this topic as long as I may judge expedient. In the first place, then, with regard to the fable which you have propagated in all your writings against the Bishop of Ypres, I beg leave to say, in one word, that you have maliciously wrested the meaning of some ambiguous expressions in one of his letters which, being capable of a good sense, ought, according to the spirit of the Gospel, to have been taken in good part, and could only be taken otherwise according to the spirit of your Society. For example, when he says to a friend, 'Give yourself no concern about your nephew, I will furnish him with what he requires from the money that lies in my hands,' what reason have you to interpret this to mean that he would take that money without restoring it, and not that he merely advanced it with the purpose of replacing it? And how extremely imprudent was it for you to furnish a refutation of your own lie, by printing the other letters of the Bishop of Ypres, which clearly show that, in point of fact, it was merely *advanced* money, which he was bound to refund

This appears to your confusion from the following terms in the letter to which you give the date of July 30 1619 Be not uneasy about the money advanced he shall want for nothing so long as he is here and likewise from another dated January 6 1620 where he says You are in too great haste when the account shall become due I have no fear but that the little credit which I have in this place will bring me as much money as I require

If you are convicted slanderers on this subject you are no less so in regard to the ridiculous story about the charity box of St Merri What advantage pray can you hope to derive from the accusation which one of your worthy friends has trumped up against that ecclesiastic? Are we to conclude that a man is guilty because he is accused? No fathers Men of piety like him may expect to be perpetually accused so long as the world contains calumniators like you We must judge of him therefore not from the accusation but from the sentence and the sentence pronounced on the case (February 23 1656) justifies him completely Moreover the person who had the temerity to involve himself in that iniquitous process was disavowed by his colleagues, and himself compelled to retract his charge And as to what you allege in the same place about that famous director who pocketed at once nine hundred thousand livres I need only refer you to Messieurs the cures of St Roch and St Paul who will bear witness before the whole city of Paris to his perfect disinterestedness in the affair and to your inexcusable malice in that piece of imposition

Enough however for such paltry falsities These are but the first raw attempts of your novices and not the master strokes of your grand professed To these do I now come fathers I come to a calumny which is certainly one of the basest that ever issued from the spirit of your Society I refer to the insufferable audacity with which you have imputed to holy nuns and to their directors the charge of disbelieving the mystery of transubstantiation and the real presence of Jesus Christ in the eucharist Here fathers is a slander worthy of yourselves Here is a crime which God alone is capable of punishing as you alone were capable of committing it To endure it with patience would require an humility as great as that of these calumniated ladies to give it credit would demand a degree of wickedness equal to that of their wretched defamers I propose not therefore to vindicate them they are beyond suspicion Had they stood in need of defence they might have commanded abler advocates than me My object in what I say here is to show not their innocence but your malignity I merely intend to make you ashamed of yourselves and to let the whole world understand that after this there is nothing of which you are not capable

You will not fail I am certain notwithstanding all this to say that I belong to Port Royal for this is the first thing you say to every one who combats your errors as if it were only at Port Royal that persons could be found possessed of sufficient zeal to defend against your attacks the purity of Christian morality I know fathers the work of the pious recluses who have retired to that monastery and how much the Church is indebted to their truly solid and edifying labours I know the excellence of their piety and their learning For though I have never had the honour to belong to their establishment as you without knowing who or what I am would fain have it believed nevertheless I do know some of them and honour the virtue of them all But God has not confined within the precincts of that society all whom he means to raise up in opposition to your corruptions

I hope, with his assistance, fathers, to make you feel this, and if he vouchsafe to *sustain me in the design he has led me to form*, of employing in his service all the resources I have received from him, I shall speak to you in such a strain as will, perhaps, give you reason to regret that you have *not* had to do with a man of Port-Royal And to convince you of this, fathers, I must tell you that, while those whom you have abused with this notorious slander content themselves with lifting up their *groans to Heaven to obtain your forgiveness for the outrage, I feel* myself obliged, not being in the least affected by your slander, to make you blush in the face of the whole Church, and so bring you to that wholesome shame of which the Scripture speaks, and which is almost the only remedy for a hardness of heart like yours *Imple facies eorum ignominia, et quærent nomen tuum, Domine*—Fill their faces with shame, that they may seek thy name, O Lord '

A stop must be put to this insolence, which does not spare the most sacred retreats For who can be safe after a calumny of this nature? For shame, fathers! to publish *in Paris such a scandalous book, with the name of your Father Meynier* on its front, and under this infamous title, *Port Royal and Geneva in concert against the most holy Sacrament of the Altar*, in which you accuse of this apostasy, not only Monsieur the abbé of St Cyran, and M Arnauld, but also Mother Agnes, his sister, and all the nuns of that monastery, alleging that 'their faith, in regard to the eucharist, is as suspicious as that of M Arnauld,' whom you maintain to be a down right Calvinist ' I here ask the whole world if there be any class of persons within the pale of the Church, on whom you could have advanced such an abominable *charge with less semblance of truth For tell me, fathers, if these* nuns and their directors had been in concert with Geneva against the most holy sacrament of the altar' (the very thought of which is shocking), how they should have come to select as the principal object of their piety that very sacrament which they held in abomination? How should they have assumed the habit of the holy sacrament? taken the name of the Daughters of the Holy Sacrament? called their church the Church of the Holy Sacrament? How should they have requested and obtained from Rome the confirmation of that institution, and the right of saying every *Thursday the office of the holy sacrament, in which the faith of the Church* is so perfectly expressed, if they had conspired with Geneva to banish that faith from the Church? Why would they have bound themselves, by a particular devotion, *also sanctioned by the Pope, to have some of their sisterhood, night and day* without intermission, in presence of the sacred host, to compensate, by their perpetual adorations towards that perpetual sacrifice, *for the impiety of the heresy that* aims at its annihilation? Tell me, fathers, if you can, why, *of all the mysteries of* our religion, they should have passed by those in which they believed, to fix upon that in which they believed not? and how they should have devoted themselves, so fully and entirely, to that mystery of our faith, if they took it, as the heretics do, for the mystery of iniquity? And what answer do you give to these clear evidences, *embodied not in words only*, but in actions, and not in some particular actions, but in the whole tenor of a life expressly dedicated to the adoration of Jesus Christ, dwelling on our altars? What answer, again, do you give to the books which you ascribe to *Port-Royal, all of which* are full of the most precise terms employed by the fathers and the councils to mark the essence of that mystery? It is at once ridiculous and disgusting to hear you replying to these as you have done throughout your libel *M Arnauld, say you, talks very well about transub-*

stantiation but he understands perhaps only a significative transubstantiation True he professes to believe in the real presence who can tell however but he means nothing more than a true and real figure ? How now fathers! whom pray will you not make pass for a Calvinist whenever you please if you are to be allowed the liberty of perverting the most canonical and sacred expressions by the wicked subtleties of your modern equivocations? Who ever thought of using any other terms than those in question especially in simple discourses of devotion where no controversies are handled? And yet the love and the reverence in which they hold this sacred mystery have induced them to give it such a prominence in all their writings that I defy you fathers with all your cunning to detect in them either the least appearance of ambiguity or the slightest correspondence with the sentiments of Geneva

Everybody knows fathers that the essence of the Genevan heresy consists as it does according to your own showing in their believing that Jesus Christ is not contained in this sacrament that it is impossible he can be in many places at once that he is properly speaking only in heaven and that it is as there alone that he ought to be adored and not on the altar that the substance of the bread remains that the body of Jesus Christ does not enter into the mouth or the stomach that he can only be eaten by faith and accordingly wicked men do not eat him at all and that the mass is not a sacrifice but an abomination Let us now hear then in what way Port Royal is in concert with Geneva In the writings of the former we read to your confusion the following statement That the flesh and blood of Jesus Christ are contained under the species of bread and wine that the Holy of Holies is present in the sanctuary and that there he ought to be adored that Jesus Christ dwells in the sinners who communicate by the real and veritable presence of his body in their stomach although not by the presence of his Spirit in their hearts that the dead ashes of the bodies of the saints derive their principal dignity from that seed of life which they retain from the touch of the immortal and vivifying flesh of Jesus Christ that it is not owing to any natural power but to the almighty power of God to whom nothing is impossible that the body of Jesus Christ is comprehended under the host and under the smallest portion of every host that the divine virtue is present to produce the effect which the words of consecration signify that Jesus Christ while he is lowered and hidden upon the altar is at the same time elevated in his glory that he subsists of himself and by his own ordinary power in divers places at the same time—in the midst of the Church triumphant and in the midst of the Church militant and travelling that the sacramental species remain suspended and subsist extraordinarily without being upheld by any subject and that the body of Jesus Christ is also suspended under the species and that it does not depend upon these as substances depend upon accidents that the substance of the bread is changed the immutable accidents remaining the same that Jesus Christ reposes in the eucharist with the same glory that he has in heaven that his glorious humanity resides in the tabernacles of the Church under the species of bread which forms its visible covering and that knowing the grossness of our natures he conducts us to the adoration of his divinity which is present in all places by the adoring of his humanity which is present in a particular place that we receive the body of Jesus Christ upon the tongue which is sanctified by its divine touch that it enters into the mouth of the priest that although

Jesus Christ has made himself accessible in the holy sacrament, by an act of his love and graciousness, he preserves, nevertheless, in that ordinance, his inaccessibility, as an inseparable condition of his divine nature, because, although the body alone and the blood alone are there, by virtue of the words—*vi verborum*, as the schoolmen say—his whole divinity may, notwithstanding, be there also, as well as his whole humanity, by a necessary conjunction In fine, that the eucharist is at the same time sacrament and sacrifice' , and that although this sacrifice is a commemoration of that of the cross, yet there is this difference between them, that the sacrifice of the mass is offered for the Church only, and for the faithful in her communion, whereas that of the cross has been offered for all the world, as the Scripture testifies '

I have quoted enough, fathers, to make it evident that there was never, perhaps, a more imprudent thing attempted than what you have done But I will go a step farther, and make you pronounce this sentence against yourselves For what do you require from a man, in order to remove all suspicion of his being in concert and correspondence with Geneva? ' If M Arnauld," says your Father Meynier, p 93, had said that, in this adorable mystery, there is no substance of the bread under the species, but only the flesh and the blood of Jesus Christ, I should have confessed that he had declared himself absolutely against Geneva Confess it, then, ye revilers! and make him a public apology How often have you seen this declaration made in the passages I have just cited? Besides this, however, the *Familiar Theology* of M de St Cyran having been approved by M Arnauld, it contains the sentiments of both Read, then, the whole of lesson 15th, and particularly article 2d, and you will there find the words you desiderate, even more formally stated than you have done yourselves "Is there any bread in the host, or any wine in the chalice? No for all the substance of the bread and the wine is taken away, to give place to that of the body and blood of Jesus Christ, the which substance alone remains therein, covered by the qualities and species of bread and wine "

How now, fathers! will you still say that Port-Royal teaches ' nothing that Geneva does not receive," and that M Arnauld has said nothing in his second letter 'which might not have been said by a minister of Charenton' ? See if you can persuade Mestrezat to speak as M Arnauld does in that letter, on page 237 Make him say that it is an infamous calumny to accuse him of denying transubstantiation, that he takes for the fundamental principle of his writings the truth of the real presence of the Son of God, in opposition to the heresy of the Calvinists, and that he accounts himself happy for living in a place where the Holy of Holies is continually adored in the sanctuary '—a sentiment which is still more opposed to the belief of the Calvinists than the real presence itself, for, as Cardinal Richelieu observes in his *Controversies* (p 536) The new ministers of France having agreed with the Lutherans, who believe the real presence of Jesus Christ in the eucharist, they have declared that they remain in a state of separation from the Church on the point of this mystery, only on account of the adoration which Catholics render to the eucharist ' Get all the passages which I have extracted from the books of Port-Royal subscribed at Geneva, and not the isolated passages merely, but the entire treatises regarding this mystery, such as the *Book of Frequent Communion*, the *Explication of the Ceremonies of the Mass*, the *Exercise during Mass*, the *Reasons of the Suspension of the Holy Sacrament*, the *Translation of the Hymns in the*

Hours of Port Royal &c in one word prevail upon them to establish at Charenton that holy institution of adoring without intermission Jesus Christ contained in the eucharist as is done at Port Royal and it will be the most signal service which you could render to the Church for in this case it will turn out not that Port Royal is in concert with Geneva but that Geneva is in concert with Port Royal and with the whole Church

Certainly fathers you could not have been more unfortunate than in selecting Port Royal as the object of attack for not believing in the eucharist but I will show what led you to fix upon it You know I have picked up some small acquaintance with your policy in this instance you have acted upon its maxims to admiration If Monsieur the abbé of St Cyran and M Arnauld had only spoken of what ought to be believed with great respect to this mystery and said nothing about what ought to be done in the way of preparation for its reception they might have been the best Catholics alive and no equivocations would have been discovered in their use of the terms *real presence* and *transubstantiation* But since all who combat your licentious principles must needs be heretics and heretics too in the very point in which they condemn your laxity how could M Arnauld escape falling under this charge on the subject of the eucharist after having published a book expressly against your profanations of that sacrament? What! must he be allowed to say with impunity that the body of Jesus Christ ought not to be given to those who habitually lapse into the same crimes and who have no prospect of amendment and that such persons ought to be excluded for some time from the altar to purify themselves by sincere penitence that they may approach it afterwards with benefit ? Suffer no one to talk in this strain fathers or you will find that fewer people will come to your confessionals Father Brisacier says that were you to adopt this course you would never apply the blood of Jesus Christ to a single individual It would be infinitely more for your interest were every one to adopt the views of your Society as set forth by your Father Mascarenhas in a book approved by your doctors and even by your reverend Father General namely That persons of every description and even priests may receive the body of Jesus Christ on the very day they have polluted themselves with odious crimes that so far from such communions implying irreverence persons who partake of them in this manner act a commendable part that confessors ought not to keep them back from the ordinance but on the contrary ought to advise those who have recently committed such crimes to communicate immediately because although the Church has forbidden it this prohibition is annulled by the universal practice in all places of the earth

See what it is fathers to have Jesuits in all places of the earth! Behold the universal practice which you have introduced and which you are anxious everywhere to maintain! It matters nothing that the tables of Jesus Christ are filled with abominations provided that your churches are crowded with people Be sure therefore cost what it may to set down all that dare to say a word against your practice as heretics on the holy sacrament But how can you do this after the irrefragable testimonies which they have given of their faith? Are you not afraid of my coming out with the four grand proofs of their heresy which you have adduced? You ought at least to be so fathers and I ought not to spare your blushing Let us then proceed to examine proof the first

M de St Cyran says Father Meynier consoling one of his friends upon the

death of his mother (tom 1, let 14), says that the most acceptable sacrifice that can be offered up to God, on such occasions, is that of patience, therefore he is a Calvinist " This is marvellously shrewd reasoning, fathers, and I doubt if anybody will be able to discover the precise point of it Let us learn it, then, from his own mouth ' Because," says this mighty controversialist, it is obvious that he does not believe in the sacrifice of the mass, for this is, of all other sacrifices, the most acceptable unto God ' Who will venture to say now that the Jesuits do not know how to reason? Why, they know the art to such perfection that they will extract heresy out of anything you choose to mention, not even excepting the Holy Scripture itself! For example, might it not be heretical to say, with the wise man in Ecclesiasticus, ' There is nothing worse than to love money ', as if adultery, murder, or idolatry, were not far greater crimes? Where is the man who is not in the habit of using similar expressions every day? May we not say, for instance, that the most acceptable of all sacrifices in the eyes of God is that of a contrite and humbled heart, just because, in discourses of this nature, we simply mean to compare certain internal virtues with one another, and not with the sacrifice of the mass, which is of a totally different order, and infinitely more exalted? Is this not enough to make you ridiculous, fathers? And is it necessary, to complete your discomfiture, that I should quote the passages of that letter in which M de St Cyran speaks of the sacrifice of the mass as the most excellent of all others, in the following terms? ' Let there be presented to God, daily and in all places, the sacrifice of the body of his Son, who could not find *a more excellent way* than that by which he might honour his Father And afterwards Jesus Christ has enjoined us to take, when we are dying, his sacrificed body, to render more acceptable to God the sacrifice of our own, and to join himself with us at the hour of dissolution, to the end that he may strengthen us for the struggle, sanctifying, by his presence, the last sacrifice which we make to God of our life and our body ? Pretend to take no notice of all this, fathers, and persist in maintaining, as you do in page 39, that he refused to take the communion on his death bed, and that he did not believe in the sacrifice of the mass Nothing can be too gross for calumniators by profession

Your second proof furnishes an excellent illustration of this To make a Calvinist of M de St Cyran, to whom you ascribe the book of *Petrus Aurelius*, you take advantage of a passage (page 80) in which Aurelius explains in what manner the Church acts towards priests, and even bishops, whom she wishes to degrade or depose 'The Church, he says, being incapable of depriving them of the power of the order, the character of which is indelible, she does all that she can do she banishes from her memory the character which she cannot banish from the souls of the individuals who have been once invested with it, she regards them in the same light as if they were not bishops or priests, so that, according to the ordinary language of the Church, it may be said they are no longer such, although they always remain such, in as far as the character is concerned—*ob indelebilitatem characteris* " You perceive, fathers, that this author, who has been approved by three general assemblies of the clergy of France, plainly declares that the character of the priesthood is indelible, and yet you make him say, on the contrary, in the very same passage, that the character of the priesthood is *not* indelible This is what I would call a notorious slander, in other words, according to your nomenclature, a small venial sin And the reason is, this book has done you some harm

by refuting the heresies of your brethren in England touching the Episcopal authority But the folly of the charge is equally remarkable for after having taken it for granted without any foundation that M de St Cyran holds the priestly character to be not indelible you conclude from this that he does not believe in the real presence of Jesus Christ in the eucharist

Do not expect me to answer this fathers If you have got no common sense I am not able to furnish you with it All who possess any share of it will enjoy a hearty laugh at your expense Nor will they treat with greater respect your third proof which rests upon the following words taken from the *Book of Frequent Communion* In the eucharist God vouchsafes us *the same food* that He bestows on the saints in heaven with this difference only that here He withholds from us its sensible sight and taste reserving both of these for the heavenly world These words express the sense of the Church so distinctly that I am constantly forgetting what reason you have for picking a quarrel with them in order to turn them to a bad use for I can see nothing more in them than what the Council of Trent teaches (sess xiii c 8) namely that there is no difference between Jesus Christ in the eucharist and Jesus Christ in heaven except that here he is veiled and there he is not M Arnauld does not say that there is no difference in the manner of receiving Jesus Christ but only that there is no difference in Jesus Christ who is received And yet you would in the face of all reason interpret his language in this passage to mean that Jesus Christ is no more eaten with the mouth in this world than he is in heaven upon which you ground the charge of heresy against him

You really make me sorry for you fathers Must we explain this further to you? Why do you confound that divine nourishment with the manner of receiving it? There is but one point of difference as I have just observed betwixt that nourishment upon earth and in heaven which is that here it is hidden under veils which deprive us of its sensible sight and taste but there are various points of dissimilarity in the manner of receiving it here and there the principal of which is as M Arnauld expresses it (p 3 ch 16) that here it enters into the mouth and the breast both of the good and of the wicked which is not the case in heaven

And if you require to be told the reason of this diversity I may inform you fathers that the cause of God s ordaining these different modes of receiving the same food is the difference that exists betwixt the state of Christians in this life and that of the blessed in heaven The state of the Christian as Cardinal Perron observes after the fathers holds a middle place between the state of the blessed and the state of the Jews The spirits in bliss possess Jesus Christ really without veil or figure The Jews possessed Jesus Christ only in figures and veils such as the manna and the paschal lamb And Christians possess Jesus Christ in the eucharist really and truly although still concealed under veils God says St Eucher has made three tabernacles the synagogue which had the shadows only without the truth the Church which has the truth and shadows together and heaven where there is no shadow but the truth alone It would be a departure from our present state which is the state of faith opposed by St Paul alike to the law and to open vision did we possess the figures only without Jesus Christ for it is the property of the law to have the mere figure and not the substance of things And it would be equally a departure from our present state if we possessed him visibly because faith according to the same apostle deals not

with things that are seen And thus the eucharist, from its including Jesus Christ truly, though under a veil, is in perfect accordance with our state of faith It follows that this state would be destroyed, if, as the heretics maintain, Jesus Christ were not really under the species of bread and wine, and it would be equally destroyed if we received him openly, as they do in heaven since, on these suppositions, our state would be confounded, either with the state of Judaism or with that of glory

Such, fathers, is the mysterious and divine reason of this most divine mystery This it is that fills us with abhorrence at the Calvinists, who would reduce us to the condition of the Jews, and this it is that makes us aspire to the glory of the beatified, where we shall be introduced to the full and eternal enjoyment of Jesus Christ From hence you must see that there are several points of difference between the manner in which he communicates himself to Christians and to the blessed, and that, amongst others, he is in this world received by the mouth, and not so in heaven, but that they all depend solely on the distinction between our state of faith and their state of immediate vision And this is precisely, fathers, what M Arnauld has expressed, with great plainness, in the following terms There can be no other difference between the purity of those who receive Jesus Christ in the eucharist and that of the blessed, than what exists between faith and the open vision of God, upon which alone depends the different manner in which he is eaten upon earth and in heaven ' You were bound in duty, fathers, to have revered in these words the sacred truths they express, instead of wresting them for the purpose of detecting an heretical meaning which they never contained, nor could possibly contain, namely, that Jesus Christ is eaten by faith only, and not by the mouth, the malicious perversion of your Fathers Annat and Meynier, which forms the capital count of their indictment

Conscious, however, of the wretched deficiency of your proofs, you have had recourse to a new artifice, which is nothing less than to falsify the Council of Trent, in order to convict M Arnauld of nonconformity with it, so vast is your store of methods for making people heretics This feat has been achieved by Father Meynier, in fifty different places of his book, and about eight or ten times in the space of a single page (the 54th), wherein he insists that to speak like a true Catholic it is not enough to say, I believe that Jesus Christ is really present in the eucharist, but we must say, I believe, *with the council*, that he is present by a true *local presence*, or locally And, in proof of this, he cites the council, session xiii, canon 3d, canon 4th, and canon 6th Who would not suppose, upon seeing the term *local presence* quoted from three canons of a universal council, that the phrase was actually to be found in them? This might have served your turn very well, before the appearance of my *Fifteenth Letter*, but, as matters now stand, fathers, the trick has become too stale for us We go our way and consult the council, and discover only that you are falsifiers Such terms as *local presence*, *locally*, and *locality*, never existed in the passages to which you refer, and let me tell you further, they are not to be found in any other canon of that council, nor in any other previous council, not in any father of the Church Allow me, then, to ask you, fathers, if you mean to cast the suspicion of Calvinism upon all that have not made use of that peculiar phrase? If this be the case, the Council of Trent must be suspected of heresy, and all the holy fathers without exception Have you no other way of making M Arnauld heretical, without abusing so many other

people who never did you any harm and among the rest St Thomas who is one of the greatest champions of the eucharist and who so far from employing that term has expressly rejected it— *Nullo modo corpus Christi est in hoc sacramento localiter* —By no means is the body of Christ in this sacrament *locally* ? Who are you then fathers to pretend on your authority to impose new terms and ordain them to be used by all for rightly expressing their faith as if the profession of the faith drawn up by the popes according to the plan of the council in which this term has no place were defective and left an ambiguity in the creed of the faithful which you had the sole merit of discovering? Such a piece of arrogance to prescribe these terms even to learned doctors! such a piece of forgery to attribute them to general councils! and such ignorance not to know the objections which the most enlightened saints have made to their reception! Be ashamed of the error of your ignorance as the Scripture says of ignorant impostors like you *De mendacio ineruditionis tuæ confundere*

Give up all further attempts then to act the masters you have neither character nor capacity for the part If however you would bring forward your propositions with a little more modesty they might obtain a hearing For although this phrase *local presence* has been rejected as you have seen by St Thomas on the ground that the body of Jesus Christ is not in the eucharist in the ordinary extension of bodies in their places the expression has nevertheless been adopted by some modern controversial writers who understand it simply to mean that the body of Jesus Christ is truly under the species which being in a particular place the body of Jesus Christ is there also And in this sense M Arnauld will make no scruple to admit the term as M de St Cyran and he have repeatedly declared that Jesus Christ in the eucharist is truly in a particular place and miraculously in many places at the same time Thus all your subtleties fall to the ground and you have failed to give the slightest semblance of plausibility to an accusation which ought not to have been allowed to show its face without being supported by the most unanswerable proofs

But what avails it fathers to oppose their innocence to your calumnies? You impute these errors to them not in the belief that they maintain heresy but from the idea that they have done you injury That is enough according to your theology to warrant you to calumniate them without criminality and you can without either penance or confession say mass at the very time that you charge priests who say it every day with holding it to be pure idolatry which were it true would amount to sacrilege no less revolting than that of your own Father Jarrige whom you yourselves ordered to be hanged in effigy for having said mass at the time he was in agreement with Geneva

What surprises me therefore is not the little scrupulosity with which you load them with crimes of the foulest and falsest description but the little prudence you display by fixing on them charges so destitute of plausibility You dispose of sins it is true at your pleasure but do you mean to dispose of men s beliefs too? Verily fathers if the suspicion of Calvinism must needs fall either on them or on you you would stand I fear on very ticklish ground Their language is as Catholic as yours but their conduct confirms their faith and your conduct belies it For if you believe as well as they do that the bread is really changed into the body of Jesus Christ why do you not require as they do from those whom you advise to approach the altar that the heart of stone and ice should be sincerely changed

into a heart of flesh and of love? If you believe that Jesus Christ is in that sacrament in a state of death, teaching those that approach it to die to the world, to sin, and to themselves, why do you suffer those to profane it in whose breasts evil passions continue to reign in all their life and vigour? And how do you come to judge those worthy to eat the bread of heaven, who are not worthy to eat that of earth?

Precious votaries, truly, whose zeal is expended in persecuting those who honour this sacred mystery by so many holy communions, and in flattering those who dishonour it by so many sacrilegious desecrations! How comely is it, in these champions of a sacrifice so pure and so venerable, to collect around the table of Jesus Christ a crowd of hardened profligates, reeking from their debaucheries, and to plant in the midst of them a priest, whom his own confessor has hurried from his obscenities to the altar, there, in the place of Jesus Christ, to offer up that most holy victim to the God of holiness, and convey it, with his polluted hands, into mouths as thoroughly polluted as his own! How well does it become those who pursue this course ' in all parts of the world, in conformity with maxims sanctioned by their own general to impute to the author of *Frequent Communion*, and to the Sisters of the Holy Sacrament, the crime of not believing in that sacrament!

Even this, however, does not satisfy them Nothing less will satiate their rage than to accuse their opponents of having renounced Jesus Christ and their baptism This is no air-built fable, like those of your invention, it is a fact, and denotes a delirious frenzy which marks the fatal consummation of your calumnies Such a notorious falsehood as this would not have been in hands worthy to support it, had it remained in those of your good friend Filleau, through whom you ushered it into the world your Society has openly adopted it, and your Father Meynier maintained it the other day to be ' *a certain truth* that Port-Royal has, for the space of thirty five years, been forming a secret plot, of which M de St Cyran and M d Ypres have been the ringleaders, to ruin the mystery of the incarnation —to make the Gospel pass for an apocryphal fable—to exterminate the Christian religion, and to erect Deism upon the ruins of Christianity Is this enough, fathers? Will you be satisfied if all this be believed of the objects of your hate? Would your animosity be glutted at length, if you could but succeed in making them odious, not only to all within the Church, by the charge of *consenting with Geneva*, of which you accuse them, but even to all who believe in Jesus Christ, though beyond the pale of the Church, by the imputation of *Deism*?

But whom do you expect to convince, upon your simple asseveration, without the slightest shadow of proof, and in the face of every imaginable contradiction, that priests who preach nothing but the grace of Jesus Christ, the purity of the Gospel, and the obligations of baptism, have renounced at once their baptism, the Gospel, and Jesus Christ? Who will believe it, fathers? Wretched as you are, do you believe it yourselves? What a sad predicament is yours, when you must either prove that they do not believe in Jesus Christ, or must pass for the most abandoned calumniators Prove it, then, fathers Name that *worthy clergyman* who, you say, attended that assembly at Bourg-Fontaine in 1621, and discovered to Brother Filleau the design there concerted of overturning the Christian religion Name those six persons whom you allege to have formed that conspiracy Name the *individual who is designated by the letters A A*, who you say *was not Antony*

Arnauld (because he convinced you that he was at that time only nine years of age) *but another person who you say is still in life but too good a friend of M Arnauld not to be known to him* You know him then fathers and consequently if you are not destitute of religion yourselves you are bound to delate that im pious wretch to the king and parliament that he may be punished according to his deserts You must speak out fathers you must name the person or submit to the disgrace of being henceforth regarded in no other light than as common liars unworthy of being ever credited again Good Father Valerien has taught us that this is the way in which such characters should be put to the rack and brought to their senses Your silence upon the present challenge will furnish a full and satisfactory confirmation of this diabolical calumny Your blindest admirers will be constrained to admit that it will be the result not of your goodness but your impotency and to wonder how you could be so wicked as to extend your hatred even to the nuns of Port Royal and to say as you do in page 14 that *The Secret Chaplet of the Holy Sacrament* composed by one of their number was the first fruit of that conspiracy against Jesus Christ or as in page 95 that they have imbibed all the detestable principles of that work which is according to your account a lesson in Deism Your falsehoods regarding that book have already been triumphantly refuted in the defence of the censure of the late Archbishop of Paris against Father Brisacier That publication you are incapable of answering and yet you do not scruple to abuse it in a more shameful manner than ever for the purpose of charging women whose piety is universally known with the vilest blasphemy

Cruel cowardly persecutors! Must then the most retired cloisters afford no retreat from your calumnies? While these consecrated virgins are employed night and day according to their institution in adoring Jesus Christ in the holy sacra ment you cease not night nor day to publish abroad that they do not believe that he is either in the eucharist or even at the right hand of his Father and you are publicly excommunicating them from the Church at the very time when they are in secret praying for the whole Church and for you! You blacken with your slanders those who have neither ears to hear nor mouths to answer you! But Jesus Christ in whom they are now hidden not to appear till one day together with him hears you and answers for them At the moment I am now writing that holy and terrible voice is heard which confounds nature and consoles the Church And I fear fathers that those who now harden their hearts and refuse with obstinacy to hear him while he speaks in the character of God will one day be compelled to hear him with terror when he speaks to them in the character of a Judge What account indeed fathers will you be able to render to him of the many calumnies you have uttered seeing that he will examine them in that day not according to the fantasies of Fathers Dicastille Gans and Pennalossa who justify them but according to the eternal laws of truth and the sacred ordinances of his own Church which so far from attempting to vindicate that crime abhors it to such a degree that she visits it with the same penalty as wilful murder? By the first and second councils of Arles she has decided that the communion shall be denied to slanderers as well as murderers till the approach of death The Council of Lateran has judged those unworthy of admission into the ecclesiastical state who have been convicted of the crime even though they may have reformed The popes have even threatened to deprive of the communion at death those who

have calumniated bishops, priests, or deacons And the authors of a defamatory libel, who fail to prove what they have advanced, are condemned by Pope Adrian *to be whipped,*—yes, reverend fathers, *flagellentur* is the word So strong has been the repugnance of the Church at all times to the errors of your Society—a Society so thoroughly depraved as to invent excuses for the grossest of crimes, such as calumny, chiefly that it may enjoy the greater freedom in perpetrating them itself There can be no doubt, fathers, that you would be capable of producing abundance of mischief in this way, had God not permitted you to furnish with your own hands the means of preventing the evil, and of rendering your slanders perfectly innocuous, for, to deprive you of all credibility, it was quite enough to publish the strange maxim that it is no crime to calumniate Calumny is nothing, if not associated with a high reputation for honesty The defamer can make no impression, unless he has the character of one that abhors defamation as a crime of which he is incapable And thus, fathers, you are betrayed by your own principle You establish the doctrine to secure yourselves a safe conscience, that you might slander without risk of damnation, and be ranked with those pious and holy calumniators of whom St Athanasius speaks To save yourselves from hell, you have embraced a maxim which promises you this security on the faith of your doctors, but this same maxim, while it guarantees you, according to their idea, against the evils you dread in the future world, deprives you of all the advantage you may have expected to reap from it in the present, so that, in attempting to escape the guilt, you have lost the benefit of calumny Such is the self contrariety of evil, and so completely does it confound and destroy itself by its own intrinsic malignity

You might have slandered, therefore, much more advantageously for yourselves, had you professed to hold, with St Paul, that evil speakers are not worthy to see God, for in this case, though you would indeed have been condemning yourselves, your slanders would at least have stood a better chance of being believed But, by maintaining, as you have done, that calumny against your enemies is no crime, your slanders will be discredited, and you yourselves damned into the bargain, for two things are certain, fathers first, That it will never be in the power of your grave doctors to annihilate the justice of God, and, secondly, That you could not give more certain evidence that you are not of the Truth than by your resorting to falsehood If the Truth were on your side, she would fight for you—she would conquer for you, and whatever enemies you might have to encounter, 'the Truth would set you free from them, according to her promise But you have had recourse to falsehood, for no other design than to support the errors with which you flatter the sinful children of this world, and to bolster up the calumnies with which you persecute every man of piety who sets his face against these delusions The truth being diametrically opposed to your ends, it behooved you, to use the language of the prophet, to put your confidence in lies ' You have said The scourges which afflict mankind shall not come nigh unto us, for we have made lies our refuge, and under falsehood have we hid ourselves But what says the prophet in reply to such? Forasmuch, says he, as ye have put your trust in calumny and tumult—*sperastis in calumnia et in tumultu*—this iniquity and your ruin shall be like that of a high wall whose breaking cometh suddenly at an instant And he shall break it as the breaking of the potter s vessel that is shivered in pieces —with such violence that there shall not be found in the

bursting of it a shred to take fire from the hearth or to take water withal out of the pit Because as another prophet says ye have made the heart of the righteous sad whom I have not made sad and ye have flattered and strengthened the malice of the wicked I will therefore deliver my people out of your hands and ye shall know that I am their Lord and yours

Yes fathers it is to be hoped that if you do not repent God will deliver out of your hands those whom you have so long deluded either by flattering them in their evil courses with your licentious maxims or by poisoning their minds with your slanders He will convince the former that the false rules of your casuists will not screen them from His indignation and He will impress on the minds of the latter the just dread of losing their souls by listening and yielding credit to your slanders as you lose yours by hatching these slanders and disseminating them through the world Let no man be deceived God is not mocked none may violate with impunity the commandment which He has given us in the Gospel not to condemn our neighbour without being well assured of his guilt And consequently what profession soever of piety those may make who lend a willing ear to your lying devices and under what pretence soever of devotion they may entertain them they have reason to apprehend exclusion from the kingdom of God solely for having imputed crimes of such a dark complexion as heresy and schism to Catholic priests and holy nuns upon no better evidence than such vile fabrications as yours The devil says M de Geneve is on the tongue of him that slanders and in the ear of him that listens to the slanderer And evil speaking says St Bernard is a poison that extinguishes charity in both of the parties so that a single calumny may prove mortal to an infinite numbers of souls killing not only those who publish it but all those besides by whom it is not repudiated

Reverend fathers my letters were not wont either to be so prolix or to follow so closely on one another Want of time must plead my excuse for both of these faults The present letter is a very long one simply because I had no leisure to make it shorter You know the reason of this haste better than I do You have been unlucky in your answers You have done well therefore to change your plan but I am afraid that you will get no credit for it and that people will say it was done for fear of the Benedictines

I have just come to learn that the person who was generally reported to be the author of your *Apologies* disclaims them and is annoyed at their having been ascribed to him He has good reason and I was wrong to have suspected him of any such thing for in spite of the assurances which I received I ought to have considered that he was a man of too much good sense to believe your accusations and of too much honour to publish them if he did not believe them There are few people in the world capable of your extravagances they are peculiar to yourselves and mark your character too plainly to admit of any excuse for having failed to recognize your hand in their concoction I was led away by the common report but this apology which would be too good for you is not sufficient for me who profess to advance nothing without certain proof In no other instance have I been guilty of departing from this rule I am sorry for what I said I retract it and I only wish that you may profit by my example

LETTER XVII

To the reverend father Annat, Jesuit

January 23, 1657

Reverend Father,

Your former behaviour had induced me to believe that you were anxious for a truce in our hostilities, and I was quite disposed to agree that it should be so Of late, however, you have poured forth such a volley of pamphlets, in such rapid succession, as to make it apparent that peace rests on a very precarious footing when it depends on the silence of Jesuits I know not if this rupture will prove very advantageous to you, but, for my part, I am far from regretting the opportunity which it affords me of rebutting that stale charge of heresy with which your writings abound

It is full time, indeed, that I should, once for all, put a stop to the liberty you have taken to treat me as a heretic—a piece of gratuitous impertinence which seems to increase by indulgence, and which is exhibited in your last book in a style of such intolerable assurance that, were I not to answer the charge as it deserves, I might lay myself open to the suspicion of being actually guilty So long as the insult was confined to your associates I despised it, as I did a thousand others with which they interlarded their productions To these my *Fifteenth Letter* was a sufficient reply But you now repeat the charge with a different air you make it the main point of your vindication It is, in fact, almost the only thing in the shape of argument that you employ You say that, ' as a complete answer to my fifteen letters, it is enough to say fifteen times that I am a heretic, and, having been pronounced such, I deserve no credit In short, you make no question of my apostasy, but assume it as a settled point, on which you may build with all confidence You are serious then, father, it would seem, in deeming me a heretic I shall be equally serious in replying to the charge

You are well aware, sir, that heresy is a charge of so grave a character that it is an act of high presumption to advance, without being prepared to substantiate it I now demand your proofs When was I seen at Charenton? When did I fail in my presence at mass, or in my Christian duty to my parish church? What act of union with heretics, or of schism with the Church, can you lay to my charge? What council have I contradicted? What papal constitution have I violated? You *must* answer, father, else—— You know what I mean And what *do* you answer? I beseech all to observe it First of all, you assume that the author of the letters is a Port-Royalist , then you tell us that Port Royal is declared to be heretical , and, therefore, you conclude, the author of the letters must be a heretic ' It is not on me, then, father, that the weight of this indictment falls, but on Port Royal, and I am only involved in the crime because you suppose me to belong to that establishment, so that it will be no difficult matter for me to exculpate myself from the charge I have no more to say than that I am not a member of that community, and to refer you to my letters, in which I have declared that I am a private individual ', and again in so many words, that 'I am not of Port Royal, as I said in my *Sixteenth Letter*, which preceded your publication

You must fall on some other way then to prove me heretic otherwise the whole world will be convinced that it is beyond your power to make good your accusation Prove from my writings that I do not receive the constitution My letters are not very voluminous—there are but sixteen of them—and I defy you or anybody else to detect in them the slightest foundation for such a charge I shall however with your permission produce something out of them to prove the reverse When for example I say in the Fourteenth that by killing our brethren in mortal sin according to your maxims we are damning those for whom Jesus Christ died do I not plainly acknowledge that Jesus Christ died for those who may be damned and consequently declare it to be false that he died only for the predestinated which is the error condemned in the fifth proposition? Certain it is father that I have not said a word in behalf of these impious propositions which I detest with all my heart And even though Port Royal should hold them I protest against your drawing any conclusion from this against me as thank God I have no sort of connection with any community except the Catholic Apostolic and Roman Church in the bosom of which I desire to live and die in communion with the Pope the head of the Church and beyond the pale of which I am persuaded there is no salvation

How are you to get at a person who talks in this way father? On what quarter will you assail me since neither my words nor my writings afford the slightest handle to your accusations and the obscurity in which my person is enveloped forms my protection against your threatenings? You feel yourselves smitten by an invisible hand—a hand however which makes your delinquencies visible to all the earth and in vain do you endeavour to attack me in the person of those with whom you suppose me to be associated I fear you not either on my own account or on that of any other being bound by no tie either to a community or to any individual whatsoever All the influence which your Society possesses can be of no avail in my case From this world I have nothing to hope nothing to dread nothing to desire Through the goodness of God I have no need of any man s money or any man s patronage Thus my father I elude all your attempts to lay hold of me You may touch Port Royal if you choose but you shall not touch me You may turn people out of the Sorbonne but that will not turn me out of my domicile You may contrive plots against priests and doctors but not against me for I am neither the one nor the other And thus father you never perhaps had to do in the whole course of your experience with a person so completely beyond your reach and therefore so admirably qualified for dealing with your errors—one perfectly free—one without engagement entanglement relationship or business of any kind—one too who is pretty well versed in your maxims and determined as God shall give him light to discuss them without permitting any earthly consideration to arrest or slacken his endeavours

Since then you can do nothing against me what good purpose can it serve to publish so many calumnies as you and your brethren are doing against a class of persons who are in no way implicated in our disputes? You shall not escape under these subterfuges you shall be made to feel the force of the truth in spite of them How does the case stand? I tell you that you are ruining Christian morality by divorcing it from the love of God and dispensing with its obligation and you talk about the death of Father Mester —a person whom I never saw in my life I tell you that your authors permit a man to kill another for the sake of an

when it would be dishonourable to lose it, and you reply by informing me that somebody 'has broken into the poor box at St Merri' Again, what can you possibly mean by mixing me up perpetually with the book *On the Holy Virginity*, written by some father of the Oratory, whom I never saw any more than his book? It is rather extraordinary, father, that you should thus regard all that are opposed to you as if they were one person Your hatred would grasp them all at once, and would hold them as a body of reprobates, every one of whom is responsible for all the rest

There is a vast difference between Jesuits and all their opponents There can be no doubt that you compose one body, united under one head, and your regulations, as I have shown, prohibit you from printing anything without the approbation of your superiors, who are responsible for all the errors of individual writers, and who cannot excuse themselves by saying that they did not observe the errors in any publication, for they ought to have observed them ' So say your ordinances, and so say the letters of your generals, Aquaviva, Vitelleschi, &c We have good reason, therefore, for charging upon you the errors of your associates, when we find they are sanctioned by your superiors and the divines of your Society With me, however, father, the case stands otherwise I have not subscribed to the book of the Holy Virginity All the alms boxes in Paris may be broken into, and yet I am not the less a good Catholic for all that In short, I beg to inform you, in the plainest terms, that nobody is responsible for my letters but myself, and that I am responsible for nothing but my letters

Here, father, I might fairly enough have brought our dispute to an issue, without saying a word about those other persons whom you stigmatize as heretics, in order to comprehend me under the condemnation But, as I have been the occasion of their ill treatment, I consider myself bound in some sort to improve the occasion, and I shall take advantage of it in three particulars One advantage, not inconsiderable in its way, is that it will enable me to vindicate the innocence of so many calumniated individuals Another, not inappropriate to my subject, will be to disclose, at the same time, the artifices of your policy in this accusation But the advantage which I prize most of all is that it affords me an opportunity of apprising the world of the falsehood of that scandalous report which you have been so busily disseminating, namely, that the Church is divided by a new heresy And as you are deceiving multitudes into the belief that the points on which you are raising such a storm are essential to the faith, I consider it of the last importance to quash these unfounded impressions, and distinctly to explain here what these points are, so as to show that, in point of fact, there are no heretics in the Church

I presume, then, that were the question to be asked Wherein consists the heresy of those called *Jansenists*? the immediate reply would be, These people hold that the commandments of God are impracticable to men, that grace is irresistible, that we have not free will to do either good or evil, that Jesus Christ did not die for all men, but only for the elect, in short, they maintain the five propositions condemned by the Pope ' Do you not give it out to all that this is the ground on which you persecute your opponents? Have you not said as much in your books, in your conversations, in your catechisms? A specimen of this you gave at the late Christmas festival at St Louis One of your little shepherdesses was questioned thus

For whom did Jesus Christ come into the world my dear?

For all men father

Indeed my child so you are not one of those new heretics who say that he came only for the elect?

Thus children are led to believe you and many others besides children for you entertain people with the same stuff in your sermons as Father Crasset did at Orleans before he was laid under an interdict And I frankly own that at one time I believed you myself You had given me precisely the same idea of these good people so that when you pressed them on these propositions I narrowly watched their answer determined never to see them more if they did not renounce them as palpable impieties

This however they have done in the most unequivocal way M de Sainte Beuve king s professor in the Sorbonne censured these propositions in his published writings long before the Pope and other Augustinian doctors in various publications and among others in a work *On Victorious Grace* reject the same articles as both heretical and strange doctrines In the preface to that work they say that these propositions are heretical and Lutheran forged and fabricated at pleasure and are neither to be found in Jansenius nor in his defenders They complain of being charged with such sentiments and address you in the words of St Prosper the first disciple of St Augustine their master to whom the semi Pelagians of France had ascribed similar opinions with the view of bringing him into disgrace There are persons who denounce us so blinded by passion that they have adopted means for doing so which ruin their own reputation They have for this purpose fabricated propositions of the most impious and blasphemous character which they industriously circulate to make people believe that we maintain them in the wicked sense which they are pleased to attach to them But our reply will show at once our innocence and the malignity of these persons who have ascribed to us a set of impious tenets of which they are themselves the sole inventors

Truly father when I found that they had spoken in this way before the appearance of the papal constitution—when I saw that they afterwards received that decree with all possible respect that they offered to subscribe it and that M Arnauld had declared all this in his second letter in stronger terms than I can report him I should have considered it a sin to doubt their soundness in the faith And in fact those who were formerly disposed to refuse absolution to M Arnauld s friends have since declared that after his explicit disclaimer of the errors imputed to him there was no reason left for cutting off either him or them from the communion of the Church Your associates however have acted very differently and it was this that made me begin to suspect that you were actuated by prejudice

You threatened first to compel them to sign that constitution so long as you thought they would resist it but no sooner did you see them quite ready of their own accord to submit to it than we heard no more about this Still however though one might suppose this ought to have satisfied you you persisted in calling them heretics because said you their heart belies their hand they are Catholics outwardly but inwardly they are heretics

This father struck me as very strange reasoning for where is the person of whom as much may not be said at any time? And what endless trouble and con

fusion would ensue, were it allowed to go on! "If," says Pope St Gregory, "we refuse to believe a confession of faith made in conformity to the sentiments of the Church, we cast a doubt over the faith of all Catholics whatsoever" I am afraid, father, to use the words of the same pontiff when speaking of a similar dispute this time, that your object is to make these persons heretics in spite of themselves, because to refuse to credit those who testify by their confession that they are in the true faith, is not to purge heresy, but to create it—*hoc non est hæresim purgare, sed facere* But what confirmed me in my persuasion that there was, indeed, no heretic in the Church, was finding that our so called *heretics* had vindicated themselves so successfully that you were unable to accuse them of a single error in the faith, and that you were reduced to the necessity of assailing them on questions of *fact* only, touching Jansenius, which could not possibly be construed into heresy You insist, it now appears, on their being compelled to acknowledge "that these propositions are contained in Jansenius, word for word, every one of them, in so many terms,' or, as you express it, '*Singulares, individuæ, totidem verbis apud Jansenium contentæ*'

Thenceforth your dispute became, in my eyes, perfectly indifferent So long as I believed that you were debating the truth or falsehood of the propositions, I was all attention, for that quarrel touched the faith, but when I discovered that the bone of contention was whether they were to be found word for word in Jansenius or not, as religion ceased to be interested in the controversy, I ceased to be interested in it also Not but that there was some presumption that you were speaking the truth, because to say that such and such expressions are to be found word for word in an author, is a matter in which there can be no mistake I do not wonder, therefore, that so many people, both in France and at Rome, should have been led to believe, on the authority of a phrase so little liable to suspicion, that Jansenius has actually taught these obnoxious tenets And, for the same reason, I was not a little surprised to learn that this same point of fact, which you had propounded as so certain and so important, was false, and that, after being challenged to quote the pages of Jansenius in which you had found these propositions "word for word," you have not been able to point them out to this day

I am the more particular in giving this statement, because, in my opinion, it discovers, in a very striking light, the spirit of your Society in the whole of this affair, and because some people will be astonished to find that, notwithstanding all the facts above mentioned, you have not ceased to publish that they are heretics still But you have only altered the heresy to suit the time, for no sooner had they freed themselves from one charge than your fathers, determined that they should never want an accusation, substituted another in its place Thus, in 1653, their heresy lay in the *quality* of the propositions, then came the *word for word* heresy, after that we had the *heart* heresy And now we hear nothing of any of these, and they must be heretics, forsooth, unless they sign a declaration to the effect '*that the sense of the doctrine of Jansenius is contained in the sense of the five propositions*'

Such is your present dispute It is not enough for you that they condemn the five propositions, and everything in Jansenius that bears any resemblance to them, or is contrary to St Augustine, for all that they have done already The point at issue is not, for example, if Jesus Christ died for the elect only—they condemn that as much as you do, but, is Jansenius of that opinion, or not? And here I declare, more strongly than ever, that your quarrel affects me as little as it affects the

Church For although I am no doctor any more than you father I can easily see nevertheless that it has no connection with the faith The only question is to ascertain what is the sense of Jansenius Did they believe that his doctrine corresponded to the proper and literal sense of these propositions they would condemn it and they refuse to do so because they are convinced it is quite the reverse so that although they should misunderstand it still they would not be heretics seeing they understand it only in a Catholic sense

To illustrate this by an example I may refer to the conflicting sentiments of St Basil and St Athanasius regarding the writings of St Denis of Alexandria which St Basil conceiving that he found in them the sense of Arius against the equality of the Father and the Son condemned as heretical but which St Athanasius on the other hand judging them to contain the genuine sense of the Church maintained to be perfectly orthodox Think you then father that St Basil who held these writings to be Arian had a right to brand St Athanasius as a heretic because he defended them? And what ground would he have had for so doing seeing that it was not Arianism that his brother defended but the true faith which he considered these writings to contain? Had these two saints agreed about the true sense of these writings and had both recognized this heresy in them unquestionably St Athanasius could not have approved of them without being guilty of heresy but as they were at variance respecting the sense of the passage St Athanasius was orthodox in vindicating them even though he may have understood them wrong because in that case it would have been merely an error in a matter of fact and because what he defended was really the Catholic faith which he supposed to be contained in these writings

I apply this to you father Suppose you were agreed upon the sense of Jansenius and your adversaries were ready to admit with you that he held for example *that grace cannot be resisted* those who refused to condemn him would be heretical But as your dispute turns upon the meaning of that author and they believe that according to this doctrine *grace may be resisted* whatever heresy you may be pleased to attribute to him you have no ground to brand them as heretics seeing they condemn the sense which you put on Jansenius and you dare not condemn the sense which they put on him If therefore you mean to convict them show that the sense which they ascribe to Jansenius is heretical for then they will be heretical themselves But how could you accomplish this since it is certain according to your own showing that the meaning which they give to his language has never been condemned?

To elucidate the point still further I shall assume as a principle what you yourselves acknowledge—*that the doctrine of efficacious grace has never been condemned and that the pope has not touched it by his constitution* And in fact when he proposed to pass judgement on the five propositions the question of efficacious grace was protected against all censure This is perfectly evident from the judgements of the consulters to whom the Pope committed them for examination These judgements I have in my possession in common with many other persons in Paris and among the rest the Bishop of Montpelier who brought them from Rome It appears from this document that they were divided in their sentiments that the chief persons among them such as the Master of the Sacred Palace the commissary of the Holy Office the General of the Augustinians and others conceiving that these propositions might be understood in the sense of *efficacious grace* were of opinion that

they ought not to be censured, whereas the rest, while they agreed that the propositions would not have merited condemnation had they borne that sense, judged that they ought to be censured, because, as they contended, this was very far from being their proper and natural sense The Pope, accordingly, condemned them, and all parties have acquiesced in his judgement

It is certain, then, father, that efficacious grace has not been condemned Indeed, it is so powerfully supported by St Augustine, by St Thomas, and all his school, by a great many popes and councils, and by all tradition, that to tax it with heresy would be an act of impiety Now, all those whom you condemn as heretics declare that they find nothing in Jansenius, but this doctrine of efficacious grace And this was the only point which they maintained at Rome You have acknowledged this yourself when you declare that when pleading before the pope, they did not say a single word about the propositions, but occupied the whole time in talking about efficacious grace ' So that, whether they be right or wrong in this supposition, it is undeniable, at least, that what they suppose to be the sense is not heretical sense, and that, consequently, they are no heretics, for, to state the matter in two words, either Jansenius has merely taught the doctrine of efficacious grace, and in this case he has no errors, or he has taught some other thing, and in this case he has no defenders The whole question turns on ascertaining whether Jansenius has actually maintained something different from efficacious grace, and, should it be found that he has, you will have the honour of having better understood him, but they will not have the misfortune of having erred from the faith

It is matter of thankfulness to God, then, father, that there is in reality no heresy in the Church The question relates entirely to a point of fact, of which no heresy can be made, for the Church, with divine authority, decides the points of *faith*, and cuts off from her body all who refuse to receive them But she does not act in the same manner in regard to matters of *fact* And the reason is that our sal vation is attached to the faith which has been revealed to us, and which is preserved in the Church by tradition, but that it has no dependence on facts which have not been revealed by God Thus we are bound to believe that the commandments of God are not impracticable, but we are under no obligation to know what Jansenius has said upon that subject In the determination of points of faith, God guides the Church by the aid of His unerring Spirit, whereas in matters of fact He leaves her to the direction of reason and the senses, which are the natural judges of such matters None but God was able to instruct the Church in the faith, but to learn whether this or that proposition is contained in Jansenius, all we require to do is to read his book And from hence it follows that, while it is heresy to resist the decisions of the faith, because this amounts to an opposing of our own spirit to the Spirit of God, it is no heresy, though it may be an act of presumption, to disbelieve certain particular facts, because this is no more than opposing reason—it may be enlightened reason—to an authority which is great indeed, but in this matter not infallible

What I have now advanced is admitted by all theologians, as appears from the following axiom of Cardinal Bellarmine, a member of your Society General and lawful councils are incapable of error in defining the dogmas of faith, but they may err in questions of fact In another place he says The pope as pope, and even as the head of a universal council, may err in particular controversies of fact, which depend principally on the information and testimony of men ' Cardinal

Baronius speaks in the same manner Implicit submission is due to the decisions of councils in points of faith but in so far as persons and their writings are concerned the censures which have been pronounced against them have not been so rigourously observed because there is none who may not chance to be deceived in such matters I may add that to prove this point the Archbishop of Toulouse has deduced the following rule from the letters of two great popes—St Leon and Pelagius II That the proper object of councils is the faith and whatsoever is determined by them independently of the faith may be reviewed and examined anew whereas nothing ought to be re examined that has been decided in a matter of faith because as Tertullian observes the rule of faith alone is immovable and irrevocable

Hence it has been seen that while general and lawful councils have never contradicted one another in points of faith because as M de Toulouse has said it is not allowable to examine *de novo* decisions in matters of faith several instances have occurred in which these same councils have disagreed in points of fact where the discussion turned upon the sense of an author because as the same prelate observes quoting the popes as his authorities everything determined in councils not referring to the faith may be reviewed and examined *de novo* An example of this contrariety was furnished by the fourth and fifth councils which differed in their interpretation of the same authors The same thing happened in the case of two popes about a proposition maintained by certain monks of Scythia Pope Hormisdas understanding it in a bad sense had condemned it but Pope John II his successor upon re examining the doctrine understood it in a good sense approved it and pronounced it to be orthodox Would you say that for this reason one of these popes was a heretic? And must you not consequently acknowledge that provided a person condemn the heretical sense which a pope may have ascribed to a book he is no heretic because he declines condemning that book while he understands it in a sense which it is certain the pope has not condemned? If this cannot be admitted one of these popes must have fallen into error

I have been anxious to familiarize you with these discrepancies among Catholics regarding questions of fact which involve the understanding of the sense of a writer showing you father against father pope against pope and council against council to lead you from these to other examples of opposition similar in their nature but somewhat more disproportioned in respect of the parties concerned For in the instances I am now to adduce you will see councils and popes ranged on one side and Jesuits on the other and yet you have never charged your brethren for this opposition even with presumption much less with heresy

You are well aware father that the writings of Origen were condemned by a great many popes and councils and particularly by the fifth general council as chargeable with certain heresies and among others that of *the reconciliation of the devils at the day of judgement* Do you suppose that after this it became absolutely imperative as a test of Catholicism to confess that Origen actually maintained these errors and that it is not enough to condemn them without attributing them to him? If this were true what would become of your worthy Father Halloix who has asserted the purity of Origen s faith as well as many other Catholics who have attempted the same thing such as Pico Mirandola and Genebrard doctor of the Sorbonne? Is it not moreover a certain fact that the same fifth general council condemned the writings of Theodoret against St Cyril describing them

as impious, "contrary to the true faith, and tainted with the Nestorian heresy"? And yet this has not prevented Father Sirmond, a Jesuit, from defending him, or from saying, in his life of that father, that "his writings are entirely free from the heresy of Nestorius."

It is evident, therefore, that as the Church, in condemning a book, assumes that the error which she condemns is contained in that book, it is a point of faith to hold that error as condemned, but it is not a point of faith to hold that the book, in fact, contains the error which the Church supposes it does. Enough has been said, I think, to prove this, I shall, therefore, conclude my examples by referring to that of Pope Honorius, the history of which is so well known. At the commencement of the seventh century, the Church being troubled by the heresy of the Monothelites, that pope, with the view of terminating the controversy, passed a decree which seemed favourable to these heretics, at which many took offence. The affair, nevertheless, passed over without making much disturbance during his pontificate, but fifty years after, the Church being assembled in the sixth general council, in which Pope Agathon presided by his legates, this decree was impeached, and, after being read and examined, was condemned as containing the heresy of the Monothelites, and under that character burnt, in open court, along with the other writings of these heretics. Such was the respect paid to this decision, and such the unanimity with which it was received throughout the whole Church, that it was afterwards ratified by two other general councils, and likewise by two popes, Leo II and Adrian II, the latter of whom lived two hundred years after it had passed, and this universal and harmonious agreement remained undisturbed for seven or eight centuries. Of late years, however, some authors, and among the rest Cardinal Bellarmine, without seeming to dread the imputation of heresy, have stoutly maintained, against all this array of popes and councils, that the writings of Honorius are free from the error which had been ascribed to them, "because," says the cardinal, "general councils being liable to err in questions of fact, we have the best grounds for asserting the sixth council was mistaken with regard to the fact now under consideration, and that, misconceiving the sense of the *Letters* of Honorius, it has placed this pope most unjustly in the rank of heretics." Observe, then, I pray you, father, that a man is not heretical for saying that Pope Honorius was not a heretic, even though a great many popes and councils, after examining his writings, should have declared that he was so.

I now come to the question before us, and shall allow you to state your case as favourably as you can. What will you then say, father, in order to stamp your opponents as heretics? That "Pope Innocent X has declared that the error of the five propositions is to be found in Jansenius"? I grant you that, what inference do you draw from it? That "it is heretical to deny that the error of the five propositions is to be found in Jansenius"? How so, father? Have we not here a question of fact exactly similar to the preceding examples? The Pope has declared that the error of the five propositions is contained in Jansenius, in the same way as his predecessors decided that the errors of the Nestorians and the Monothelites polluted the pages of Theodoret and Honorius. In the latter case, your writers hesitate not to say that, while they condemn the heresies, they do not allow that these authors actually maintained them, and, in like manner, your opponents now say that they condemn the five propositions, but cannot admit that Jansenius has taught them. Truly, the two cases are as like as they could well be, and, if there be any disparity

between them it is easy to see how far it must go in favour of the present question by a comparison of many particular circumstances which as they are self evident I do not specify How comes it to pass then that when placed in precisely the same predicament your friends are Catholics and your opponents heretics? On what strange principle of exception do you deprive the latter of a liberty which you freely award to all the rest of the faithful? What answer will you make to this father? Will you say The pope has confirmed his constitution by a brief To this I would reply that two general councils and two popes confirmed the condemnation of the letters of Honorius But what argument do you found upon the language of that brief in which all that the Pope says is that he has condemned the doctrine of Jansenius in these five propositions ? What does that add to the constitution or what more can you infer from it? Nothing certainly except that as the sixth council condemned the doctrine of Honorius in the belief that it was the same with that of the Monothelites so the Pope has said that he has condemned the doctrine of Jansenius in these five propositions because he was led to suppose it was the same with that of the five propositions And how could he do otherwise than suppose it? Your Society published nothing else and you yourself father who have asserted that the said propositions were in that author word for word happened to be in Rome (for I know all your motions) at the time when the censure was passed Was he to distrust the sincerity or the competence of so many grave ministers of religion? And how could he help being convinced of the fact after the assurance which you had given him that the propositions were in that author word for word ? It is evident therefore that in the event of its being found that Jansenius has not supported these doctrines it would be wrong to say as your writers have done in the cases before mentioned that the Pope has deceived himself in this point of fact which it is painful and offensive to publish at any time the proper phrase is that you have deceived the Pope which as you are now pretty well known will create no scandal

Determined however to have a heresy made out let it cost what it may you have attempted by the following manœuvre to shift the question from the point of fact and make it bear upon a point of faith The Pope say you declares that he has condemned the doctrine of Jansenius in these five propositions therefore it is essential to the faith to hold that the doctrine of Jansenius touching these five propositions is heretical *let it be what it may* Here is a strange point of faith that a doctrine is heretical *be what it may* What! if Jansenius should happen to maintain that *we are capable of resisting internal grace* and that *it is false to say that Jesus Christ died for the elect only* would this doctrine be condemned just because it is his doctrine? Will the proposition that *man has a freedom of will to do good or evil* be true when found in the Pope s constitution and false when discovered in Jansenius? By what fatality must he be reduced to such a predicament that truth when admitted into his book becomes heresy? You must confess then that he is only heretical on the supposition that he is friendly to the errors condemned seeing that the constitution of the Pope is the rule which we must apply to Jansenius to judge if his character answer the description there given of him and accordingly the question *Is his doctrine heretical?* must be resolved by another question of fact *Does it correspond to the natural sense of these propositions?* as it must necessarily be heretical if it does correspond to that sense and must necessarily be orthodox if it be of an opposite character For in one word since according to the Pope and

the bishops, 'the propositions are condemned *in their proper and natural sense*,' they cannot possibly be condemned in the sense of Jansenius, except on the understanding that the sense of Jansenius is the same with the proper and natural sense of these propositions, and this I maintain to be purely a question of fact.

The question, then, still rests upon the point of fact, and cannot possibly be tortured into one affecting the faith. But though incapable of twisting it into a matter of heresy, you have it in your power to make it a pretext for persecution, and might, perhaps, succeed in this, were there not good reason to hope that nobody will be found so blindly devoted to your interests as to countenance such a disgraceful proceeding, or inclined to compel people, as you wish to do, to sign a declaration *that they condemn these propositions in the sense of Jansenius*, without explaining what the sense of Jansenius is. Few people are disposed to sign a blank confession of faith. Now this would really be to sign one of that description, leaving you to fill up the blank afterwards with whatsoever you pleased, as you would be at liberty to interpret according to your own taste the unexplained sense of Jansenius. Let it be explained, then, beforehand, otherwise we shall have, I fear, another version of your *proximate power*, without any sense at all—*abstrahendo ab omni sensu*. This mode of proceeding, you must be aware, does not take with the world. Men in general detest all ambiguity, especially in the matter of religion, where it is highly reasonable that one should know at least what one is asked to condemn. And how is it possible for doctors, who are persuaded that Jansenius can bear no other sense than that of efficacious grace, to consent to declare that they condemn his doctrine without explaining it, since, with their present convictions, which no means are used to alter, this would be neither more nor less than to condemn efficacious grace, which cannot be condemned without sin? Would it not, therefore, be a piece of monstrous tyranny to place them in such an unhappy dilemma that they must either bring guilt upon their souls in the sight of God, by signing that condemnation against their consciences, or be denounced as heretics for refusing to sign it?

But there is a mystery under all this. You Jesuits cannot move a step without a stratagem. It remains for me to explain why you do not explain the sense of Jansenius. The sole purpose of my writing is to discover your designs, and, by discovering, to frustrate them. I must, therefore, inform those who are not already aware of the fact that your great concern in this dispute being to uphold the *sufficient grace* of your Molina, you could not effect this without destroying the *efficacious grace* which stands directly opposed to it. Perceiving, however, that the latter was now sanctioned at Rome and by all the learned in the Church, and unable to combat the doctrine on its own merits, you resolved to attack it in a clandestine way, under the name of the doctrine of *Jansenius*. You were resolved, accordingly, to get Jansenius condemned without explanation, and to gain your purpose, gave out that his doctrine was not that of efficacious grace, so that every one might think he was at liberty to condemn the one without denying the other. Hence your efforts, in the present day, to impress this idea upon the minds of such as have no acquaintance with that author, an object which you yourself, father, have attempted, by means of the following ingenious syllogism: 'The pope has condemned the doctrine of Jansenius, but the pope has not condemned efficacious grace; therefore, the doctrine of efficacious grace must be different from that of Jansenius.' If this mode of reasoning were conclusive, it might be demonstrated

in the same way that Honorius and all his defenders are heretics of the same kind The sixth council has condemned the doctrine of Honorius but the council has not condemned the doctrine of the Church therefore the doctrine of Honorius is different from that of the Church and therefore all who defend him are heretics It is obvious that no conclusion can be drawn from this for the Pope has done no more than condemn the doctrine of the five propositions which was represented to him as the doctrine of Jansenius

But it matters not you have no intention to make use of this logic for any length of time Poor as it is it will last sufficiently long to serve your present turn All that you wish to effect by it in the meantime is to induce those who are unwilling to condemn efficacious grace to condemn Jansenius with less scruple When this object has been accomplished your argument will soon be forgotten and their signatures remaining as an eternal testimony in condemnation of Jansenius will furnish you with an occasion to make a direct attack upon efficacious grace by another mode of reasoning much more solid than the former which shall be forthcoming in proper time The doctrine of Jansenius you will argue has been condemned by the universal subscriptions of the Church Now this doctrine is manifestly that of efficacious grace (and it will be easy for you to prove that) therefore the doctrine of efficacious grace is condemned even by the confession of his defenders

Behold your reason for proposing to sign the condemnation of a doctrine without giving an explanation of it! Behold the advantage you expect to gain from subscriptions thus procured! Should your opponents however refuse to subscribe you have another trap laid for them Having dexterously combined the question of faith with that of fact and not allowing them to separate between them nor to sign the one without the other the consequence will be that because they could not subscribe the two together you will publish it in all directions that they have refused the two together And thus though in point of fact they simply decline acknowledging that Jansenius has maintained the propositions which they condemn which cannot be called heresy you will boldly assert that they have refused to condemn the propositions themselves and that it is this that constitutes their heresy

Such is the fruit which you expect to reap from their refusal and which will be no less useful to you than what you might have gained from their consent So that in the event of these signatures being exacted they will fall into your snares whether they sign or not and in both cases you will gain your point such is your dexterity in uniformly putting matters into a train for your own advantage whatever bias they may happen to take in their course!

How well I know you father! and how grieved am I to see that God has abandoned you so far as to allow you such happy success in such an unhappy course! Your good fortune deserves commiseration and can excite envy only in the breasts of those who know not what truly good fortune is It is an act of charity to thwart the success you aim at in the whole of this proceeding seeing that you can only reach it by the aid of falsehood and by procuring credit to one of two lies—either that the Church has condemned efficacious grace or that those who defend that doctrine maintain the five condemned errors

The world must therefore be apprised of two facts first That by your own confession efficacious grace has not been condemned and secondly That no

body supports these errors So that it may be known that those who refuse to sign what you are so anxious to exact from them, refuse merely in consideration of the question of *fact*, and that, being quite ready to subscribe that of *faith*, they cannot be deemed heretical on that account, because, to repeat it once more, though it be matter of faith to believe these propositions to be heretical, it will never be matter of faith to hold that they are to be found in the pages of Jansenius They are innocent of all error, that is enough It may be that they interpret Jansenius too favourably, but it may be also that you do not interpret him favourably enough I do not enter upon this question All that I know is that, according to your maxims, you believe that you may, without sin, publish him to be a heretic contrary to your own knowledge, whereas, according to their maxims, they cannot, without sin, declare him to be a Catholic, unless they are persuaded that he is one They are, therefore, more honest than you, father, they have examined Jansenius more faithfully than you, they are no less intelligent than you, they are, therefore, no less credible witnesses than you But come what may of this point of fact, they are certainly Catholics, for, in order to be so, it is not necessary to declare that another man is not a Catholic, it is enough, in all conscience, if a person, without charging error upon anybody else, succeed in discharging himself

Reverend Father, if you have found any difficulty in deciphering this letter, which is certainly not printed in the best possible type, blame nobody but yourself Privileges are not so easily granted to me as they are to you You can procure them even for the purpose of combating miracles, I cannot have them even to defend myself The printing houses are perpetually haunted In such circumstances, you yourself would not advise me to write you any more letters, for it is really a sad annoyance to be obliged to have recourse to an Osnabruck impression

LETTER XVIII

To the reverend father Annat, Jesuit

March 24, 1657

Reverend Father,

Long have you laboured to discover some error in the creed or conduct of your opponents, but I rather think you will have to confess, in the end, that it is a more difficult task than you imagined to make heretics of people who, are not only no heretics, but who hate nothing in the world so much as heresy In my last letter I succeeded in showing that you accuse them of one heresy after an other, without being able to stand by one of the charges for any length of time, so that all that remained for you was to fix on their refusal to condemn the sense of Jansenius,' which you insist on their doing without explanation You must have been sadly in want of heresies to brand them with, when you were reduced to this For who ever heard of a heresy which nobody could explain? The answer was ready, therefore that if Jansenius has no errors, it is wrong to condemn him, and if he has, you were bound to point them out, that we might know at least what we were condemning This, however, you have never yet been pleased to do,

but you have attempted to fortify your position by decrees which made nothing in your favour as they gave no sort of explanation of the sense of Jansenius said to have been condemned in the five propositions This was not the way to terminate the dispute Had you mutually agreed as to the genuine sense of Jansenius and had the only difference between you been as to whether that sense was heretical or not in that case the decisions which might pronounce it to be heretical would have touched the real question in dispute But the great dispute being about the sense of Jansenius the one party saying that they could see nothing in it inconsistent with the sense of St Augustine and St Thomas and the other party asserting that they saw in it an heretical sense which they would not express It is clear that a constitution which does not say a word about this difference of opinion and which only condemns in general and without explanation the sense of Jansenius leaves the point in dispute quite undecided

You have accordingly been repeatedly told that as your discussion turns on a matter of fact you would never be able to bring it to a conclusion without declaring what you understand by the sense of Jansenius But as you continued obstinate in your refusal to make this explanation I endeavored as a last resource to extort it from you by hinting in my last letter that there was some mystery under the efforts you were making to procure the condemnation of this sense without explaining it and that your design was to make this indefinite censure recoil some day or other upon the doctrine of efficacious grace by showing as you could easily do that this was exactly the doctrine of Jansenius This has reduced you to the necessity of making a reply for had you pertinaciously refused after such an insinuation to explain your views of that sense it would have been apparent to persons of the smallest penetration that you condemned it in the sense of efficacious grace—a conclusion which considering the veneration in which the Church holds holy doctrine would have overwhelmed you with disgrace

You have therefore been forced to speak out your mind and we find it expressed in your reply to that part of my letter in which I remarked that if Jansenius was capable of any other sense than that of efficacious grace he had no defenders but if his writings bore no other sense he had no errors to defend You found it impossible to deny this position father but you have attempted to parry it by the following distinction It is not sufficient say you for the vindication of Jansenius to allege that he merely holds the doctrine of efficacious grace for that may be held in two ways—the one heretical according to Calvin which consists in maintaining that the will when under the influence of grace has not the power of resisting it the other orthodox according to the Thomists and the Sorbonists which is founded on the principles established by the councils and which is that efficacious grace of itself governs the will in such a way that it still has the power of resisting it

All this we grant father but you conclude by adding Jansenius would be orthodox if he defended efficacious grace in the sense of the Thomists but he is heretical because he opposes the Thomists and joins issue with Calvin who denies the power of resisting grace I do not here enter upon the question of fact whether Jansenius really agrees with Calvin It is enough for my purpose that you assert that he does and that you now inform me that by the sense of Jansenius you have all along understood nothing more than the sense of Calvin Was

this all you meant, then, father? Was it only the error of Calvin that you were so anxious to get condemned, under the name of "the sense of Jansenius"? Why did you not tell us this sooner? You might have saved yourself a world of trouble, for we were all ready, without the aid of bulls or briefs, to join with you in condemning that error. What urgent necessity there was for such an explanation! What a host of difficulties has it removed! We were quite at a loss, my dear father, to know what error the popes and bishops meant to condemn, under the name of "the sense of Jansenius." The whole Church was in the utmost perplexity about it, and not a soul would relieve us by an explanation. This, however, has now been done by you, father—you, whom the whole of your party regard as the chief and prime mover of all their councils, and who are acquainted with the whole secret of this proceeding. You, then, have told us that the sense of Jansenius is neither more nor less than the sense of Calvin, which has been condemned by the council. Why, this explains everything. We know now that the error which they intended to condemn, under these terms—*the sense of Jansenius*—is neither more nor less than the sense of Calvin, and that, consequently, we, by joining with them in the condemnation of Calvin's doctrine, have yielded all due obedience to these decrees. We are no longer surprised at the zeal which the popes and some bishops manifested against "the sense of Jansenius." How, indeed, could they be otherwise than zealous against it, believing, as they did, the declarations of those who publicly affirmed that it was identically the same with that of Calvin?

I must maintain, then, father, that you have no further reason to quarrel with your adversaries, for they detest that doctrine as heartily as you do. I am only astonished to see that you are ignorant of this fact, and that you have such an imperfect acquaintance with their sentiments on this point, which they have so repeatedly expressed in their published works. I flatter myself that, were you more intimate with these writings, you would deeply regret your not having made yourself acquainted sooner, in the spirit of peace, with a doctrine which is in every respect so holy and so Christian, but which passion, in the absence of knowledge, now prompts you to oppose. You would find, father, that they not only hold that an effective resistance may be made to those feebler graces which go under the name of *exciting* or *inefficacious*, from their not terminating in the good with which they inspire us, but that they are, moreover, as firm in maintaining, in opposition to Calvin, the power which the will has to resist even efficacious and victorious grace, as they are in contending against Molina for the power of this grace over the will, and fully as jealous for the one of these truths as they are for the other. They know too well that man, of his own nature, has always the power of sinning and of resisting grace, and that, since he became corrupt, he unhappily carries in his breast a fount of concupiscence which infinitely augments that power, but that, notwithstanding this, when it pleases God to visit him with His mercy, He makes the soul do what He wills, and in the manner He wills it to be done, while, at the same time, the infallibility of the divine operation does not in any way destroy the natural liberty of man, in consequence of the secret and wonderful ways by which God operates this change. This has been most admirably explained by St. Augustine, in such a way as to dissipate all those imaginary inconsistencies which the opponents of efficacious grace suppose to exist between the sovereign power of grace over the free will and the power which the free will has to resist grace. For, according to this great saint, whom the popes and the

Church have held to be a standard authority on this subject God transforms the heart of man by shedding abroad in it a heavenly sweetness which surmounting the delights of the flesh and inducing him to feel on the one hand his own mortality and nothingness and to discover on the other hand the majesty and eternity of God makes him conceive a distaste for the pleasures of sin which interpose between him and incorruptible happiness Finding his chiefest joy in the God who charms him his soul is drawn towards Him infallibly but of its own accord by a motion perfectly free spontaneous love impelled so that it would be its torment and punishment to be separated from Him Not but that the person has always the power of forsaking his God and that he may not actually forsake Him provided he choose to do it But how *could* he choose such a course seeing that the will always inclines to that which is most agreeable to it and that in the case we now suppose nothing can be more agreeable than the possession of that *one good* which comprises in itself all other good things? *Quod enim* (says St Augustine) *amplius nos delectat secundum operemur necesse est*—Our actions are nec essarily determined by that which affords us the greatest pleasure

Such is the manner in which God regulates the free will of man without en croaching on its freedom and in which the free will which always may but never will resist His grace turns to God with a movement as voluntary as it is irresisti ble whensoever He is pleased to draw it to Himself by the sweet constraint of His efficacious inspirations

These father are the divine principles of St Augustine and St Thomas accord ing to which it is equally true that *we have the power of resisting grace* contrary to Calvin s opinion and that nevertheless to employ the language of Pope Clement VIII in his paper addressed to the Congregation *de Auxiliis* God forms within us the motion of our will and effectually disposes of our hearts by virtue of that em pire which His supreme majesty has over the volitions of men as well as over the other creatures under heaven according to St Augustine

On the same principle it follows that we act of ourselves and thus in opposi tion to another error of Calvin that we have merits which are truly and properly *ours* and yet as God is the first principle of our actions and as in the language of St Paul He worketh in us that which is pleasing in his sight our merits are the gifts of God as the Council of Trent says

By means of this distinction we demolish the profane sentiment of Luther con demned by that Council namely that we co operate in no way whatever towards our salvation any more than inanimate things and by the same mode of reason ing we overthrow the equally profane sentiment of the school of Molina who will not allow that it is by the strength of divine grace that we are enabled to co operate with it in the work of our salvation and who thereby comes into hostile collision with that principle of faith established by St Paul That it is God who worketh in us both to will and to do

In fine in this way we reconcile all those passages of Scripture which seem quite inconsistent with each other such as the following Turn ye unto God — Turn thou us and we shall be turned — Cast away iniquity from you — It is God who taketh away iniquity from His people — Bring forth works meet for repent ance — Lord thou hast wrought all our works in us — Make ye a new heart and a new spirit — A new spirit will I give you and a new heart will I create within you &c.

The only way of reconciling these apparent contrarieties, which ascribe our good actions at one time to God and at another time to ourselves, is to keep in view the distinction, as stated by St Augustine, that 'our actions are ours in respect of the free will which produces them, but that they are also of God, in respect of His grace which enables our free will to produce them', and that, as the same writer elsewhere remarks, 'God enables us to do what is pleasing in His sight, by making us will to do even what we might have been unwilling to do.'

It thus appears, father, that your opponents are perfectly at one with the modern Thomists, for the Thomists hold with them both the power of resisting grace, and the infallibility of the effect of grace, of which latter doctrine they profess themselves the most strenuous advocates, if we may judge from a common maxim of their theology, which Alvarez, one of the leading men among them, repeats so often in his book, and expresses in the following terms (disp 72, n 4) 'When efficacious grace moves the free will, it infallibly consents, because the effect of grace is such, that, although the will has the power of withholding its consent, it nevertheless consents in effect.' He corroborates this by a quotation from his master, St Thomas 'The will of God cannot fail to be accomplished, and, accordingly, when it is his pleasure that a man should consent to the influence of grace, he consents infallibly, and even necessarily, not by an absolute necessity, but by a necessity of infallibility.' In effecting this, divine grace does not trench upon 'the power which man has to resist it, if he wishes to do so', it merely prevents him from wishing to resist it. This has been acknowledged by your Father Petau, in the following passage (Book 1, p 602) 'The grace of Jesus Christ insures infallible perseverance in piety, though not by necessity, for a person may refuse to yield his consent to grace, if he be so inclined, as the council states, but that same grace provides that he shall never be so inclined.'

This, father, is the uniform doctrine of St Augustine, of St Prosper, of the fathers who followed them, of the councils, of St Thomas, and of all the Thomists in general. It is likewise, whatever you may think of it, the doctrine of your opponents. And, let me add, it is the doctrine which you yourself have lately sealed with your approbation. I shall quote your own words 'The doctrine of efficacious grace, which admits that we have a power of resisting it, is orthodox, founded on the councils, and supported by the Thomists and Sorbonists.' Now, tell us the plain truth, father, if you had known that your opponents really held this doctrine, the interests of your Society might perhaps have made you scruple before pronouncing this public approval of it, but, acting on the supposition that they were hostile to the doctrine, the same powerful motive has induced you to authorize sentiments which you know in your heart to be contrary to those of your Society, and by this blunder, in your anxiety to ruin their principles, you have yourself completely confirmed them. So that, by a kind of prodigy, we now behold the advocates of efficacious grace vindicated by the advocates of Molina—an admirable instance of the wisdom of God in making all things concur to advance the glory of the truth.

Let the whole world observe, then, that, by your own admission, the truth of this efficacious grace, which is so essential to all the acts of piety, which is so dear to the Church, and which is the purchase of her Saviour's blood, is so indisputably Catholic that there is not a single Catholic, not even among the Jesuits, who would not acknowledge its orthodoxy. And let it be noticed, at the same time, that, ac-

cording to your own confession not the slightest suspicion of error can fall on those whom you have so often stigmatized with it For so long as you charged them with clandestine heresies without choosing to specify them by name it was as difficult for them to defend themselves as it was easy for you to bring such accusations But now when you have come to declare that the error which constrains you to oppose them is the heresy of Calvin which you supposed them to hold it must be apparent to every one that they are innocent of all error for so decidedly hostile are they to this the only error you charge upon them that they protest by their discourses by their books by every mode in short in which they can testify their sentiments that they condemn that heresy with their whole heart and in the same manner as it has been condemned by the Thomists whom you acknowledge without scruple to be Catholics and who have never been suspected to be any thing else

What will you say against them now father? Will you say that they are heretics still because although they do not adopt the sense of Calvin they will not allow that the sense of Jansenius is the same with that of Calvin? Will you presume to say that this is matter of heresy? Is it not a pure question of fact with which heresy has nothing to do? It would be heretical to say that we have not the power of resisting efficacious grace but would it be so to doubt that Jansenius held that doctrine? Is this a revealed truth? Is it an article of faith which must be believed on pain of damnation? Or is it not in spite of you a point of fact on account of which it would be ridiculous to hold that there were heretics in the Church?

Drop this epithet then father and give them some other name more suited to the nature of your dispute Tell them they are ignorant and stupid—that they misunderstand Jansenius These would be charges in keeping with your controversy but it is quite irrelevant to call them heretics As this however is the only charge from which I am anxious to defend them I shall not give myself much trouble to show that they rightly understand Jansenius All I shall say on the point father is that it appears to me that were he to be judged according to your own rules it would be difficult to prove him not to be a good Catholic We shall try him by the test you have proposed To know say you whether Jansenius is sound or not we must inquire whether he defends efficacious grace in the manner of Calvin who denies that man has the power of resisting it—in which case he would be heretical or in the manner of the Thomists who admit that it may be resisted—for then he would be Catholic Judge then father whether he holds that grace may be resisted when he says That we have always a power to resist grace according to the council that free will may always act or not act will or not will consent or not consent do good or do evil and that man in this life has always these two liberties which may be called by some contradictions Judge likewise if he be not opposed to the error of Calvin as you have described it when he occupies a whole chapter (21st) in showing that the Church has condemned that heretic who denies that efficacious grace acts on the free will in the manner which has been so long believed in the Church so as to leave it in the power of free will to consent or not to consent whereas according to St Augustine and the council we have always the power of withholding our consent if we choose and according to St Prosper God bestows even upon his elect the will to persevere in such a way as not to deprive them of the power to will the contrary And

in one word, judge if he does not agree with the Thomists, from the following declaration in chapter 4th That all that the *Thomists have written with the view of* reconciling the efficaciousness of grace with the power of resisting it, so entirely coincides with his judgement that to ascertain his sentiments on this subject we have only to consult their writings

Such being the language he holds on these heads my opinion is that he believes in the power of resisting grace, that he differs from Calvin and agrees with the Thomists, because he has said so, and that he is, therefore, according to your own showing, a Catholic *If you have any means of knowing the sense of an author* otherwise than by his expressions, and if, without quoting any of his passages, you are disposed to maintain, in direct opposition to his own words, that he denies this power of resistance, and that he is for Calvin and against the Thomists, do not be afraid, father, that I will accuse you of heresy for that I shall only say that you do not seem properly to understand Jansenius, but we shall not be the less on that account children of the same Church

How comes it, then, father, that you manage this dispute in such a passionate spirit, and that you treat as your most cruel enemies, and as the most pestilent of heretics, a class of persons whom you cannot accuse of any error, nor of anything whatever, except that they do not understand Jansenius as you do? For what else in the world do you dispute about, except the sense of that author? You would have them to condemn it They ask what you mean them to condemn You reply that you mean the error of Calvin They rejoin that they condemn that error, and *with this acknowledgement (unless it is syllables you wish to condemn, and not* the thing which they signify), you ought to rest satisfied If they refuse to say that they condemn the sense of Jansenius, it is because they believe it to be that of St Thomas, and thus this unhappy phrase has a very equivocal meaning betwixt you In your mouth it signifies the sense of Calvin, in theirs the sense of St Thomas Your dissensions arise entirely from the different ideas which you attach to the same term Were I made umpire in the quarrel, I would interdict the use of *the word Jansenius, on both sides,* and thus, by obliging you merely to express what you understand by it, it would be seen that you ask nothing more than the condemnation of Calvin, to which they willingly agree, and that they ask nothing more than the vindication of the sense of St Augustine and St Thomas, in which you again perfectly coincide

I declare, then, father, that for my part I shall continue to regard them as good Catholics, whether they condemn Jansenius, on finding him erroneous, or refuse *to condemn him, from* finding that he maintains nothing more than what you yourself acknowledge to be orthodox, and that I shall say to them what St Jerome said to John, bishop of Jerusalem, who was accused of holding the eight propositions of Origen Either condemn Origen, if you acknowledge that he has maintained these errors, or else deny that he has maintained them—*Aut nega hoc dixisse eum qui arguitur, aut si locutus est talia, eum damna qui dixerit*

See, father, how these persons acted, whose sole concern was with principles, and not with persons, whereas you who aim at persons more than principles, consider it a matter of no consequence to condemn errors, unless you procure the condemnation of the individuals to whom you choose to impute them

How ridiculously *violent your conduct is, father! and how ill calculated to insure success!* I told you before, and I repeat it, violence and verity can make no

impression on each other Never were your accusations more outrageous and never was the innocence of your opponents more discernible never has efficacious grace been attacked with greater subtilty and never has it been more triumphantly established You have made the most desperate efforts to convince people that your disputes involved points of faith and never was it more apparent that the whole controversy turned upon a mere point of fact In fine you have moved heaven and earth to make it appear that this point of fact is founded on truth and never were people more disposed to call it in question And the obvious reason of this is that you do not take the natural course to make them believe a point of fact which is to convince their senses and point out to them in a book the words which you allege are to be found in it The means you have adopted are so far removed from this straightforward course that the most obtuse minds are unavoidably struck by observing it Why did you not take the plan which I followed in bringing to light the wicked maxims of your authors—which was to cite faithfully the passages of their writings from which they were extracted? This was the mode followed by the cures of Paris and it never fails to produce conviction But when you were charged by them with holding for example the proposition of Father Lamy that a monk may kill a person who threatens to publish calumnies against himself or his order when he cannot otherwise prevent the publication what would you have thought and what would the public have said if they had not quoted the place where that sentiment is literally to be found? or if after having been repeatedly demanded to quote their authority they still obstinately refused to do it? or if instead of acceding to this they had gone off to Rome and procured a bull ordaining all men to acknowledge the truth of their statement? Would it not be undoubtedly concluded that they had surprised the Pope and that they would never have had recourse to this extraordinary method but for want of the natural means of substantiating the truth which matters of fact furnish to all who undertake to prove them? Accordingly they had no more to do than to tell us that Father Lamy teaches this doctrine *in Book 5 disp 36 n 118 page 544 of the Douay edition* and by this means everybody who wished to see it found it out and nobody could doubt about it any longer This appears to be a very easy and prompt way of putting an end to controversies of fact when one has got the right side of the question

How comes it then father that you do not follow this plan? You said in your book that the five propositions are in Jansenius word for word in the identical terms—*iisdem verbis* You were told they were not What had you to do after this but either to cite the page if you had really found the words or to acknowledge that you were mistaken But you have done neither the one nor the other In place of this on finding that all the passages from Jansenius which you sometimes adduce for the purpose of hoodwinking the people are not the condemned propositions in their individual identity as you had engaged to show us, you present us with Constitutions from Rome which without specifying any particular place declare that the propositions have been extracted from his book

I am sensible father of the respect which Christians owe to the Holy See and your antagonists give sufficient evidence of their resolution ever to abide by its decisions Do not imagine that it implied any deficiency in this due deference on their part that they represented to the pope with all the submission which children owe to their father and members to their head that it was possible he might be

deceived on this point of fact—that he had not caused it to be investigated during his pontificate, and that his predecessor, Innocent X, had merely examined into the heretical character of the propositions, and not into the fact of their connection with Jansenius This they stated to the commissary of the Holy Office, one of the principal examiners, stating that they could not be censured according to the sense of any author, because they had been presented for examination on their own merits, and without considering to what author they might belong further, that upwards of sixty doctors, and a vast number of other persons of learning and piety, had read that book carefully over, without ever having encountered the proscribed propositions, and that they have found some of a quite opposite description that those who had produced that impression on the mind of the Pope might be reasonably presumed to have abused the confidence he reposed in them, inasmuch as they had an interest in decrying that author, who has convicted Molina of upwards of fifty errors that what renders this supposition still more probable is that they have a certain maxim among them, one of the best authenticated in their whole system of theology, which is, that they may, without criminality, calumniate those by whom they conceive themselves to be unjustly attacked , and that, accordingly, their testimony being so suspicious, and the testimony of the other party so respectable, they had some ground for supplicating his holiness, with the most profound humility, that he would ordain an investigation to be made into this fact, in the presence of doctors belonging to both parties, in order that a solemn and regular decision might be formed on the point in dispute Let there be a convocation of able judges (says St Basil on a similar occasion, Epistle 75), let each of them be left at perfect freedom, let them examine my writings, let them judge if they contain errors against the faith, let them read the objections and the replies, that so a judgement may be given in due form and with proper knowledge of the case, and not a defamatory libel without examination

It is quite vain for you, father, to represent those who would act in the manner I have now supposed as deficient in proper subjection to the Holy See The popes are very far from being disposed to treat Christians with that imperiousness which some would fain exercise under their name 'The Church,' says Pope St Gregory, 'which has been trained in the school of humility, does not command with authority, but persuades by reason, her children whom she believes to be in error, to obey what she has taught them And so far from deeming it a disgrace to review a judgement into which they may have been surprised, we have the testimony of St Bernard for saying that they glory in acknowledging the mistake 'The Apostolic See (he says, Epistle 180) can boast of this recommendation, that it never stands on the point of honour, but willingly revokes a decision that has been gained from it by surprise, indeed, it is highly just to prevent any from profiting by an act of injustice, and more especially before the Holy See

Such, father, are the proper sentiments with which the popes ought to be inspired, for all divines are agreed that they may be surprised, and that their supreme character, so far from warranting them against mistakes, exposes them the more readily to fall into them, on account of the vast number of cares which claim their attention This is what the same St Gregory says to some persons who were astonished at the circumstance of another pope having suffered himself to be deluded 'Why do you wonder, says he, 'that we should be deceived we who are but

men? Have you not read that David a king who had the spirit of prophecy was induced by giving credit to the fal ehoods of Ziba to pronounce an unjust judge ment against the son of Jonathan? Who will think it strange then that we who are not prophets should sometimes be imposed upon by deceivers? A multi plicity of affairs presses on us and our minds which by being obliged to attend to so many things at once apply themselves less closely to each in particular are the more easily liable to be imposed upon in individual cases Truly father I should suppose that the popes know better than you whether they may be de ceived or not They themselves tell us that popes as well as the greatest princes are more exposed to deception than individuals who are less occupied with im portant avocations This must be believed on their testimony And it is easy to imagine by what means they come to be thus overreached St Bernard in the let ter which he wrote to Innocent II gives us the following description of the proc ess It is no wonder and no novelty that the human mind may be deceived and is deceived You are surrounded by monks who come to you in the spirit of lying and deceit They have filled your ears with stories against a bishop whose life has been most exemplary but who is the object of their hatred These persons bite like dogs and strive to make good appear evil Meanwhile most holy father you put yourself into a rage against your own son Why have you afforded matter of joy to his enemies? B lieve not every spirit but try the spirits whether they be of God I trust that when you have ascertained the truth all this delusion, which rests on a false report will be dissipated I pray the spirit of truth to grant you the grace to separate light from darkness and to favour the good by rejecting the evil You see then father that the eminent rank of the popes does not exempt them from the influence of delusion and I may now add that it only serves to render their mistakes more dangerous and important than those of other men This is the light in which St Bernard represents them to Pope Eugenius There is another fault so common among the great of this world that I never met one of them who was free from it and that is holy father an excessive credulity the source of numerous disorders From this proceed violent persecutions against the innocent unfounded prejudices against the absent and tremendous storms about nothing (*pro nihilo*) This holy father is a universal evil from the influence of which if you are exempt I shall only say you are the only individual among all your compeers who can boast of that privilege

I imagine father that the proofs I have brought are beginning to convince you that the popes are liable to be surprised But to complete your conversion I shall merely remind you of some examples which you yourself have quoted in your book of popes and emperors whom heretics have actually deceived You will remember then that you have told us that Apollinarius surprised Pope Damasius in the same way that Celestius surprised Zozimus You inform us besides that one called Athanasius deceived the Emperor Heraclius and prevailed on him to persecute the Catholics And lastly that Sergius obtained from Honorius that infamous decretal which was burned at the sixth council by playing the busy body as you say about the person of that pope

It appears then father by your own confession that those who act this part about the persons of kings and popes do sometimes artfully entice them to perse cute the faithful defenders of the truth under the persuasion that they are perse cuting heretics And hence the popes who hold nothing in greater horror than

these surprisals, have, by a letter of Alexander III, enacted an ecclesiastical statute, which is inserted in the canonical law, to permit the suspension of the execution of their bulls and decretals, when there is ground to suspect that they have been imposed upon "If," says that pope to the Archbishop of Ravenna, "we sometimes send decretals to your fraternity which are opposed to your sentiments, give yourselves no distress on that account We shall expect you either to carry them respectfully into execution, or to send us the reason why you conceive they ought not to be executed, for we deem it right that you should not execute a decree which may have been procured from us by artifice and surprise Such has been the course pursued by the popes, whose sole object is to settle the disputes of Christians, and not to follow the passionate counsels of those who strive to involve them in trouble and perplexity Following the advice of St Peter and St Paul, who in this followed the commandment of Jesus Christ, they avoid domination The spirit which appears in their whole conduct is that of peace and truth In this spirit they ordinarily insert in their letters this clause, which is tacitly understood in them all *Si ita est, si preces veritate nitantur*—If it be so as we have heard it, if the facts be true" It is quite clear, if the popes themselves give no force to their bulls, except in so far as they are founded on genuine facts, that it is not the bulls alone that prove the truth of the facts, but that, on the contrary, even according to the canonists, it is the truth of the facts which renders the bulls lawfully admissible

In what way, then, are we to learn the truth of facts? It must be by the eyes, father, which are the legitimate judges of such matters, as reason is the proper judge of things natural and intelligible, and faith of things supernatural and revealed For, since you will force me into this discussion, you must allow me to tell you that, according to the sentiments of the two greatest doctors of the Church, St Augustine and St Thomas, these three principles of our knowledge, the senses, reason, and faith, have each their separate objects and their own degrees of certainty And as God has been pleased to employ the intervention of the senses to give entrance to faith (for "faith cometh by hearing"), it follows, that so far from faith destroying the certainty of the senses, to call in question the faithful report of the senses would lead to the destruction of faith It is on this principle that St Thomas explicitly states that God has been pleased that the sensible accidents should subsist in the eucharist, in order that the senses, which judge only of these accidents, might not be deceived

We conclude, therefore, from this, that whatever the proposition may be that is submitted to our examination, we must first determine its nature, to ascertain to which of those three principles it ought to be referred If it relate to a supernatural truth, we must judge of it neither by the senses nor by reason but by Scripture and the decisions of the Church Should it concern an unrevealed truth and something within the reach of natural reason, reason must be its proper judge And if it embrace a point of fact, we must yield to the testimony of the senses, to which it naturally belongs to take cognizance of such matters

So general is this rule that, according to St Augustine and St Thomas, when we meet with a passage even in the Scripture, the literal meaning of which at first sight, appears contrary to what the senses or reason are certainly persuaded of, we must not attempt to reject their testimony in this case, and yield them up to the authority of that apparent sense of the Scripture, but we must interpret the Scripture, and seek out therein another sense agreeable to that sensible truth, because,

the Word of God being infallible in the facts which it records and the information of the senses and of reason acting in their sphere being certain also it follows that there must be an agreement between these two sources of knowledge And as Scripture may be interpreted in different ways whereas the testimony of the senses is uniform we must in these matters adopt as the true interpretation of Scripture that view which corresponds with the faithful report of the senses Two things says St Thomas must be observed according to the doctrine of St Augustine first That Scripture has always one true sense and secondly That as it may receive various senses when we have discovered one which reason plainly teaches to be false we must not persist in maintaining that this is the natural sense but search out another with which reason will agree

St Thomas explains his meaning by the example of a passage in Genesis where it is written that God created two great lights the sun and the moon and also the stars in which the Scriptures appear to say that the moon is greater than all the stars but as it is evident from unquestionable demonstration that this is false it is not our duty says that saint obstinately to defend the literal sense of that passage another meaning must be sought consistent with the truth of the fact such as the following That the phrase *great light* as applied to the moon denotes the greatness of that luminary merely as it appears in our eyes and not the magnitude of its body considered in itself

An opposite mode of treatment so far from procuring respect to the Scripture would only expose it to the contempt of infidels because as St Augustine says when they found that we believed on the authority of Scripture in things which they assuredly knew to be false they would laugh at our credulity with regard to its more recondite truths such as the resurrection of the dead and eternal life And by this means adds St Thomas we should render our religion contemptible in their eyes and shut up its entrance into their minds

And let me add father that it would in the same manner be the likeliest means to shut up the entrance of Scripture into the minds of heretics and to render the pope s authority contemptible in their eyes to refuse all those the name of Catholics who would not believe that certain words were in a certain book where they are not to be found merely because a pope by mistake has declared that they are It is only by examining a book that we can ascertain what words it contains Matters of fact can only be proved by the senses If the position which you maintain be true show it or else ask no man to believe it—that would be to no purpose Not all the powers on earth can by the force of authority persuade us of a point of fact any more than they can alter it for nothing can make that to be not which really is

It was to no purpose for example that the monks of Ratisbon procured from Pope St Leo IX a solemn decree by which he declared that the body of St Denis the first bishop of Paris who is generally held to have been the Areopagite had been transported out of France and conveyed into the chapel of their monastery It is not the less true for all this that the body of that saint always lay and lies to this hour in the celebrated abbey which bears his name and within the walls of which you would find it no easy matter to obtain a cordial reception to this bull, although the pope has therein assured us that he has examined the affair with all possible diligence (*diligentissime*) and with the advice of many bishops and prelates so that he strictly enjoins all the French (*districte praecipientes*) to own and con

fess that these holy relics are no longer in their country" The French, however, who knew that fact to be untrue, by the evidence of their own eyes, and who, upon opening the shrine, found all those relics entire, as the historians of that period inform us, believed then, *as they have always believed since, the reverse of what* that holy pope had enjoined them to believe, well knowing that even saints and prophets are liable to be imposed upon

It was to equally little purpose that you obtained against Galileo a decree from Rome condemning his opinion respecting the motion of the earth It will never be proved by such an argument as this that the earth remains stationary, and if it can be demonstrated by sure observation that it is the earth and not the sun that revolves, the efforts and arguments of all mankind put together will not hinder our planet from revolving, nor hinder themselves from revolving along with her

Again, you must not imagine that the letters of Pope Zachary, excommunicating St Virgilius for maintaining the existence of the antipodes, have annihilated the New World, nor must you suppose that, although he declared that opinion to be a most dangerous heresy, the King of Spain was wrong in giving more credence to Christopher Columbus, who came from the place, than to the judgement of the pope, who had never been there, or that the Church has not derived a vast benefit from the discovery, inasmuch as it has brought the knowledge of the Gospel to a great multitude of souls who might otherwise have perished in their infidelity

You see, then, father, what is the nature of matters of fact, and on what principles they are to be determined, from all which, to recur to our subject, it is easy to conclude that, if the five propositions are not in Jansenius, it is impossible that they can have been extracted from him, and that the only way to form a judgement *on the matter, and to produce universal conviction, is to examine that book* in a regular conference, as you have been desired to do long ago Until that be done, you have no right to charge your opponents with contumacy, for they are as blameless in regard to the point of fact as they are of errors in point of faith —Catholics in doctrine, reasonable in fact, and innocent in both

Who can help feeling astonishment, then, father, to see on the one side a vindication so complete, and on the other accusations so outrageous! Who would suppose that the only question between you relates to a single fact of no importance, which the one party wishes the other to believe without showing it to them! And who would ever imagine that such a noise should have been made in the Church for nothing (*pro nihilo*), as good St Bernard says! But this is just one of the principal tricks of your policy, to make people believe that everything is at stake, when, in reality, there is nothing at stake, and to represent to those influential persons who listen to you that the most pernicious errors of Calvin, and the most vital principles of the faith, are involved in your disputes, with the view of inducing them, under this conviction, to employ all their zeal and all their authority against your opponents, as if the safety of the Catholic religion depended upon it, whereas, if they came to know that the whole dispute was about this paltry point of fact, they would give themselves no concern about it, but would, on the contrary, regret extremely that, to gratify your private passions, they had made such exertions in an affair of no consequence to the Church For, in fine, to take the worst view of the matter, even though it should be true that Jansenius maintained these propositions, what great misfortune would accrue from some persons doubting of the fact, provided they detested the propositions, as they

have publicly declared that they do? Is it not enough that they are condemned by everybody without exception and that too in the sense in which you have explained that you wish them to be condemned? Would they be more severely censured by saying that Jansenius maintained them? What purpose then would be served by exacting this acknowledgment except that of disgracing a doctor and bishop who died in the communion of the Church? I cannot see how that should be accounted so great a blessing as to deserve to be purchased at the expense of so many disturbances What interest has the state or the pope or bishops or doctors or the Church at large in this conclusion? It does not affect them in any way whatever father it can affect none but your Society which would certainly enjoy some pleasure from the defamation of an author who has done you some little injury Meanwhile everything is in confusion because you have made people believe that everything is in danger This is the secret spring giving impulse to all those mighty commotions which would cease immediately were the real state of the controversy once known And therefore as the peace of the Church depended on this explanation it was I conceive of the utmost importance that it should be given that by exposing all your disguises it might be manifest to the whole world that your accusations were without foundation your opponents without error and the Church without heresy

Such father is the end which it has been my desire to accomplish an end which appears to me in every point of view so deeply important to religion that I am at a loss to conceive how those to whom you furnish so much occasion for speaking can contrive to remain in silence Granting that they are not affected with the personal wrongs which you have committed against them those which the Church suffers ought in my opinion to have forced them to complain Besides I am not altogether sure if ecclesiastics ought to make a sacrifice of their reputation to calumny especially in the matter of religion They allow you nevertheless to say whatever you please so that had it not been for the opportunity which by mere accident you afforded me of taking their part the scandalous impressions which you are circulating against them in all quarters would in all probability have gone forth without contradiction Their patience I confess astonishes me and the more so that I cannot suspect it of proceeding either from timidity or from incapacity being well assured that they want neither arguments for their own vindication nor zeal for the truth And yet I see them religiously bent on silence to a degree which appears to me altogether unjustifiable For my part father I do not believe that I can possibly follow their example Leave the Church in peace and I shall leave you as you are with all my heart but so long as you make it your sole business to keep her in confusion doubt not but that there shall always be found within her bosom children of peace who will consider themselves bound to employ all their endeavours to preserve her tranquillity

LETTER XIX

Fragment of a nineteenth provincial letter, addressed to Father Annat

Reverend Sir,

If I have caused you some dissatisfaction, in former *Letters*, by my endeavours to establish the innocence of those whom you were labouring to asperse, I shall afford you pleasure in the present by making you acquainted with the sufferings which you have inflicted upon them Be comforted, my good father, the objects of your enmity are in distress! And if the Reverend the Bishops should be induced to carry out, in their respective dioceses, the advice you have given them, to cause to be subscribed and sworn a certain matter of fact, which is, in itself, not credible, and which it cannot be obligatory upon any one to believe—you will indeed succeed in plunging your opponents to the depth of sorrow, at witnessing the Church brought into so abject a condition

Yes, sir, I have seen them, and it was with a satisfaction inexpressible! I have seen these holy men, and this was the attitude in which they were found They were not wrapt up in a philosophic magnanimity, they did not affect to exhibit that indiscriminate firmness which urges implicit obedience to every momentary impulsive duty, nor yet were they in a frame of weakness and timidity, which would prevent them from either discerning the truth, or following it when discerned But I found them with minds pious, composed, and unshaken, impressed with a meek deference for ecclesiastical authority, with tenderness of spirit, zeal for truth, and a desire to ascertain and obey her dictates filled with a salutary suspicion of themselves, distrusting their own infirmity, and regretting that it should be thus exposed to trial, yet withal, sustained by a modest hope that their Lord will deign to instruct them by his illuminations, and sustain them by his power, and believing that that peace of their Saviour, whose sacred influences it is their endeavour to maintain, and for whose cause they are brought into suffering, will be at once their guide and their support! I have, in fine, seen them maintaining a character of Christian piety, whose power

I found them surrounded by their friends, who had hastened to impart those counsels which they deemed the most fitting in their present exigency I have heard those counsels, I have observed the manner in which they were received, and the answers given and truly, my father, had you yourself been present, I think you would have acknowledged that, in their whole procedure, there was the entire absence of a spirit of insubordination and schism, and that their only desire and aim was to preserve inviolate two things—to them infinitely precious—peace and truth

For, after due representations had been made to them of the penalties they would draw upon themselves by their refusal to sign the Constitution and the scandal it might cause in the Church, their reply was

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NOTE *Passages* erased by Pascal are enclosed in square brackets, thus [ ] *Words*, added or corrected by the editor of the text, are similarly denoted, but are in *italics*



PENSÉES



SECTION I

THOUGHTS ON MIND AND ON STYLE

1 *The difference between the mathematical and the intuitive mind*—In the one, the principles are palpable, but removed from ordinary use, so that for want of habit it is difficult to turn one s mind in that direction but if one turns it thither ever so little, one sees the principles fully, and one must have a quite inaccurate mind who reasons wrongly from principles so plain that it is almost impossible they should escape notice

But in the intuitive mind the principles are found in common use and are be fore the eyes of everybody One has only to look, and no effort is necessary, it is only a question of good eyesight, but it must be good, for the principles are so subtle and so numerous that it is almost impossible but that some escape notice Now the omission of one principle leads to error, thus one must have very clear sight to see all the principles and, in the next place, an accurate mind not to draw false deductions from known principles

All mathematicians would then be intuitive if they had clear sight, for they do not reason incorrectly from principles known to them, and intuitive minds would be mathematical if they could turn their eyes to the principles of mathematics to which they are unused

The reason, therefore, that some intuitive minds are not mathematical is that they cannot at all turn their attention to the principles of mathematics But the reason that mathematicians are not intuitive is that they do not see what is before them, and that, accustomed to the exact and plain principles of mathematics, and not reasoning till they have well inspected and arranged their principles, they are lost in matters of intuition where the principles do not allow of such arrangement They are scarcely seen, they are felt rather than seen, there is the greatest difficulty in making them felt by those who do not of themselves perceive them These principles are so fine and so numerous that a very delicate and very clear sense is needed to perceive them, and to judge rightly and justly when they are perceived, without for the most part being able to demonstrate them in order as in mathe matics, because the principles are not known to us in the same way, and because it would be an endless matter to undertake it We must see the matter at once, at one glance, and not by a process of reasoning, at least to a certain degree And thus it is rare that mathematicians are intuitive and that men of intuition are math ematicians, because mathematicians wish to treat matters of intuition mathemati-

cally and make themselves ridiculous wishing to begin with definitions and then with axioms which is not the way to proceed in this kind of reasoning Not that the mind does not do so but it does it tacitly naturally and without technical rules for the expression of it is beyond all men and only a few can feel it

Intuitive minds on the contrary being thus accustomed to judge at a single glance are so astonished when they are presented with propositions of which they understand nothing and the way to which is through definitions and axioms so sterile and which they are not accustomed to see thus in detail that they are re pelled and disheartened

But dull minds are never either intuitive or mathematical

Mathematicians who are only mathematicians have exact minds provided all things are explained to them by means of definitions and axioms otherwise they are inaccurate and insufferable for they are only right when the principles are quite clear

And men of intuition who are only intuitive cannot have the patience to reach to first principles of things speculative and conceptual which they have never seen in the world and which are altogether out of the common

2 There are different kinds of right understanding some have right understand ing in a certain order of things and not in others where they go astray Some draw conclusions well from a few premises and this displays an acute judgment

Others draw conclusions well where there are many premises

For example the former easily learn hydrostatics where the premises are few but the conclusions are so fine that only the greatest acuteness can reach them

And in spite of that these persons would perhaps not be great mathematicians because mathematics contain a great number of premises and there is perhaps a kind of intellect that can search with ease a few premises to the bottom and can not in the least penetrate those matters in which there are many premises

There are then two kinds of intellect the one able to penetrate acutely and deep ly into the conclusions of given premises and this is the precise intellect the other able to comprehend a great number of premises without confusing them and this is the mathematical intellect The one has force and exactness the other compre hension Now the one quality can exist without the other the intellect can be strong and narrow and can also be comprehensive and weak

3 Those who are accustomed to judge by feeling do not understand the process of reasoning for they would understand at first sight and are not used to seek for principles And others on the contrary who are accustomed to reason from prin ciples do not at all understand matters of feeling seeking principles and being unable to see at a glance

4 *Mathematics intuition* —True eloquence makes light of eloquence true mor ality makes light of morality that is to say the morality of the judgement which has no rules makes light of the morality of the intellect

For it is to judgement that perception belongs as science belongs to intellect Intuition is the part of judgement mathematics of intellect

To make light of philosophy is to be a true philosopher

5 Those who judge of a work by rule are in regard to others as those who have a watch are in regard to others One says, 'It is two hours ago , the other says, 'It is only three quarters of an hour " I look at my watch, and say to the one, ' You are weary, and to the other, ' Time gallops with you", for it is only an hour and a half ago, and I laugh at those who tell me that time goes slowly with me and that I judge by imagination They do not know that I judge by my watch

6 Just as we harm the understanding, we harm the feelings also

The understanding and the feelings are moulded by intercourse, the understanding and feelings are corrupted by intercourse Thus good or bad society improves or corrupts them It is, then, all important to know how to choose in order to improve and not to corrupt them, and we cannot make this choice, if they be not already improved and not corrupted Thus a circle is formed, and those are fortunate who escape it

7 The greater intellect one has, the more originality one finds in men Ordinary persons find no difference between men

8 There are many people who listen to a sermon in the same way as they listen to vespers

9 When we wish to correct with advantage and to show another that he errs, we must notice from what side he views the matter, for on that side it is usually true, and admit that truth to him, but reveal to him the side on which it is false He is satisfied with that, for he sees that he was not mistaken and that he only failed to see all sides Now, no one is offended at not seeing everything, but one does not like to be mistaken, and that perhaps arises from the fact that man naturally cannot see everything, and that naturally he cannot err in the side he looks at, since the perceptions of our senses are always true

10 People are generally better persuaded by the reasons which they have them selves discovered than by those which have come into the mind of others

11 All great amusements are dangerous to the Christian life, but among all those which the world has invented there is none more to be feared than the theatre It is a representation of the passions so natural and so delicate that it excites them and gives birth to them in our hearts, and, above all, to that of love, principally when it is represented as very chaste and virtuous For the more innocent it appears to innocent souls, the more they are likely to be touched by it Its violence pleases our self love, which immediately forms a desire to produce the same effects which are seen so well represented, and, at the same time, we make ourselves a conscience founded on the propriety of the feelings which we see there, by which the fear of pure souls is removed, since they imagine that it cannot hurt their purity to love with a love which seems to them so reasonable

So we depart from the theatre with our heart so filled with all the beauty and tenderness of love, the soul and the mind so persuaded of its innocence, that we are quite ready to receive its first impressions, or rather to seek an opportunity of awakening them in the heart of another, in order that we may receive the same

pleasures and the same sacrifices which we have seen so well represented in the theatre

12 Scaramouch who only thinks of one thing
The doctor who speaks for a quarter of an hour after he has said everything so full is he of the desire of talking

13 One likes to see the error the passion of Cleobuline because she is unconscious of it She would be displeasing if she were not deceived

14 When a natural discourse paints a passion or an effect one feels within oneself the truth of what one reads which was there before although one did not know it Hence one is inclined to love him who makes us feel it for he has not shown us his own riches but ours And thus this benefit renders him pleasing to us besides that such community of intellect as we have with him necessarily inclines the heart to love

15 Eloquence which persuades by sweetness not by authority as a tyrant not as a king

16 Eloquence is an art of saying things in such a way (1) that those to whom we speak may listen to them without pain and with pleasure (2) that they feel themselves interested so that self love leads them more willingly to reflection upon it
It consists then in a correspondence which we seek to establish between the head and the heart of those to whom we speak on the one hand and on the other between the thoughts and the expressions which we employ This assumes that we have studied well the heart of man so as to know all its powers and then to find the just proportions of the discourse which we wish to adapt to them We must put ourselves in the place of those who are to hear us and make trial on our own heart of the turn which we give to our discourse in order to see whether one is made for the other and whether we can assure ourselves that the hearer will be as it were forced to surrender We ought to restrict ourselves so far as possible to the simple and natural and not to magnify that which is little or belittle that which is great It is not enough that a thing be beautiful it must be suitable to the subject and there must be in it nothing of excess or defect

17 Rivers are roads which move and which carry us whither we desire to go

18 When we do not know the truth of a thing it is of advantage that there should exist a common error which determines the mind of man as for example the moon to which is attributed the change of seasons the progress of diseases etc For the chief malady of man is restless curiosity about things which he cannot understand and it is not so bad for him to be in error as to be curious to no purpose
The manner in which Epictetus Montaigne and Salomon de Tultie wrote is the most usual the most suggestive the most remembered and the oftenest quoted because it is entirely composed of thoughts born from the common talk of

life As when we speak of the common error which exists among men that the moon is the cause of everything, we never fail to say that Salomon de Tultie says that, when we do not know the truth of a thing, it is of advantage that there should exist a common error, etc , which is the thought above

19 The last thing one settles in writing a book is what one should put in first

20 *Order* —Why should I undertake to divide my virtues into four rather than into six? Why should I rather establish virtue in four, in two, in one? Why into *Abstine et sustine*[1] rather than into Follow Nature, or, Conduct your private affairs without injustice, ' as Plato, or anything else? But there, you will say, every thing is contained in one word Yes, but it is useless without explanation, and when we come to explain it, as soon as we unfold this maxim which contains all the rest, they emerge in that first confusion which you desired to avoid So, when they are all included in one, they are hidden and useless, as in a chest, and never appear save in their natural confusion Nature has established them all without including one in the other

21 Nature has made all her truths independent of one another Our art makes one dependent on the other But this is not natural Each keeps its own place

22 Let no one say that I have said nothing new, the arrangement of the subject is new When we play tennis, we both play with the same ball, but one of us places it better

I had as soon it said that I used words employed before And in the same way if the same thoughts in a different arrangement do not form a different discourse, no more do the same words in their different arrangement form different thoughts!

23 Words differently arranged have a different meaning, and meanings differently arranged have different effects

24 *Language* —We should not turn the mind from one thing to another, except for relaxation, and that when it is necessary and the time suitable, and not otherwise For he that relaxes out of season wearies, and he who wearies us out of season makes us languid, since we turn quite away So much does our perverse lust like to do the contrary of what those wish to obtain from us without giving us pleasure, the coin for which we will do whatever is wanted

25 *Eloquence* —It requires the pleasant and the real, but the pleasant must itself be drawn from the true

26 Eloquence is a painting of thought, and thus those who, after having painted it, add something more, make a picture instead of a portrait

27 *Miscellaneous Language* —Those who make antitheses by forcing words are like those who make false windows for symmetry Their rule is not to speak accurately, but to make apt figures of speech

[1] Abstain and uphold Stoic maxim

28 Symmetry is what we see at a glance based on the fact that there is no reason for any difference and based also on the face of man whence it happens that symmetry is only wanted in breadth not in height or depth

9 When we see a natural style we are astonished and delighted for we expected to see an author and we find a man Whereas those who have good taste and who seeing a book expect to find a man are quite surprised to find an author *Plus poetice quam humane locutus es* [1] Those honour Nature well who teach that she can speak on everything even on theology

30 We only consult the ear because the heart is wanting The rule is uprightness

Beauty of omission of judgement

31 All the false beauties which we blame in Cicero have their admirers and in great number

32 There is a certain standard of grace and beauty which consists in a certain relation between our nature such as it is weak or strong and the thing which pleases us

Whatever is formed according to this standard pleases us be it house song discourse verse prose woman birds rivers trees rooms dress etc Whatever is not made according to this standard displeases those who have good taste

And as there is a perfect relation between a song and a house which are made after a good model because they are like this good model though each after its kind even so there is a perfect relation between things made after a bad model Not that the bad model is unique for there are many but each bad sonnet for example on whatever false model it is formed is just like a woman dressed after that model

Nothing makes us understand better the ridiculousness of a false sonnet than to consider nature and the standard and then to imagine a woman or a house made according to that standard

33 *Poetical beauty* —As we speak of poetical beauty so ought we to speak of mathematical beauty and medical beauty But we do not do so and the reason is that we know well what is the object of mathematics and that it consists in proofs and what is the object of medicine and that it consists in healing But we do not know in what grace consists which is the object of poetry We do not know the natural model which we ought to imitate and through lack of this knowledge we have coined fantastic terms The golden age The wonder of our times Fatal etc and call this jargon poetical beauty

But whoever imagines a woman after this model which consists in saying little things in big words will see a pretty girl adorned with mirrors and chains at whom he will smile because we know better wherein consists the charm of woman than the charm of verse But those who are ignorant would admire her in this dress and there are many villages in which she would be taken for the queen hence we call sonnets made after this model Village Queens

[1] Petronius 90 You have spoken more as a poet than as a man

34 No one passes in the world as skilled in verse unless he has put up the sign of a poet, a mathematician, etc But educated people do not want a sign and draw little *distinction between the trade of a poet and that of an embroiderer*

People of education are not called poets or mathematicians, etc , but they are all these and judges of all these No one guesses what they are When they come into society, they talk on matters about which the rest are talking We do not observe in them one quality rather than another, save when they have to make use of it But then we remember it, for it is characteristic of such persons that we do not say of them that they are fine speakers, when it is not a question of oratory, and that we say of them that they are fine speakers, when it is such a question

It is therefore false praise to give a man when we say of him, on his entry, that he is a very clever poet, and it is a bad sign when a man is not asked to give his judgement on some verses

35 We should not be able to say of a man, ' He is a mathematician, or a *preacher," or "eloquent , but that he is a gentleman ' That universal quality* alone pleases me It is a bad sign when, on seeing a person, you remember his book I would prefer you to see no quality till you meet it and have occasion to use it (*Ne quid nimis*),[1] for fear some one quality prevail and designate the man Let none think him a fine speaker, unless oratory be in question, and then let them think it

36 Man is full of wants he loves only those who can satisfy them all This one is a good mathematician,' one will say But I have nothing to do with mathematics, he would take me for a proposition That one is a good soldier ' He would take me for a besieged town I need, then, an upright man who can accommodate himself generally to all my wants

37 [Since we cannot be universal and know all that is to be known of everything, we ought to know a little about everything For it is far better to know something about everything than to know all about one thing This universality is the best If we can have both, still better, but if we must choose, we ought to choose the former And the world feels this and does so, for the world is often a good judge][2]

38 A poet and not an honest man

39 If lightning fell on low places, etc poets, and those who can only reason about things of that kind, would lack proofs

40 If we wished to prove the examples which we take to prove other things, we should have to take those other things to be examples, *for*, as we always believe the difficulty is in what we wish to prove, we find the examples clearer and a help to demonstration

Thus, when we wish to demonstrate a general theorem we must give the rule

[1] Nothing in excess
[2] *Passages* erased by Pascal are enclosed in square brackets *Words* added or corrected by the editor of the text are similarly denoted but are in *italics*

as applied to a particular case but if we wish to demonstrate a particular case we must begin with the general rule For we always find the thing obscure which we wish to prove and that clear which we use for the proof for when a thing is put forward to be proved we first fill ourselves with the imagination that it is there fore obscure and on the contrary that what is to prove it is clear, and so we understand it easily

41 *Epigrams of Martial*—Man loves malice but not against one eyed men nor the unfortunate but against the fortunate and proud People are mistaken in thinking otherwise

For lust is the source of all our actions and humanity etc We must please those who have humane and tender feelings That epigram about two one eyed people is worthless for it does not console them and only gives a point to the author s glory All that is only for the sake of the author is worthless *Ambitiosa recident ornamenta*[1]

42 To call a king Prince is pleasing because it diminishes his rank

43 Certain authors speaking of their works say My book My commentary My history etc They resemble middle class people who have a house of their own and always have My house on their tongue They would do better to say Our book Our commentary Our history etc because there is in them usually more of other people s than their own

44 Do you wish people to believe good of you? Don t speak

45 Languages are ciphers wherein letters are not changed into letters but words into words so that an unknown language is decipherable

46 A maker of witticisms a bad character

47 There are some who speak well and write badly For the place and the audience warm them and draw from their minds more than they think of without that warmth

48 When we find words repeated in a discourse and in trying to correct them discover that they are so appropriate that we would spoil the discourse we must leave them alone This is the test and our attempt is the work of envy which is blind and does not see that repetition is not in this place a fault for there is no general rule

49 To mask nature and disguise her No more king pope bishop—but *august monarch* etc not Paris—*the capital of the kingdom* There are places in which we ought to call Paris *Paris* and others in which we ought to call it *the capital of the kingdom*

50 The same meaning changes with the words which express it Meanings re

[1] Horace *Epistle to the Pisos* 447 "They curtailed pretentious ornaments

ceive their dignity from words instead of giving it to them Examples should be sought

51 Sceptic, for obstinate

52 No one calls another a Cartesian but he who is one himself, a pedant but a pedant, a provincial but a provincial, and I would wager it was the printer who put it on the title of *Letters to a Provincial*

53 A carriage *upset* or *overturned* according to the meaning *To spread abroad* or *upset*, according to the meaning (The argument by force of M le Maitre over the friar)

54 *Miscellaneous* —A form of speech, I should have liked to apply myself to that '

55 The *aperitive* virtue of a key, the *attractive* virtue of a hook

56 To guess 'The part that I take in your trouble The Cardinal did not want to be guessed

My mind is disquieted *I am disquieted* is better

57 I always feel uncomfortable under such compliments as these I have given you a great deal of trouble, I am afraid I am boring you, I fear this is too long ' We either carry our audience with us, or irritate them

58 You are ungraceful ' Excuse me, pray Without that excuse I would not have known there was anything amiss With reverence be it spoken " The only thing bad is their excuse

59 "To extinguish the torch of sedition , too luxuriant 'The restlessness of his genius , two superfluous grand words

SECTION II

THE MISERY OF MAN WITHOUT GOD

60 *First part* Misery of man without God
Second part Happiness of man with God
Or, *First part* That nature is corrupt Proved by nature itself
Second part That there is a Redeemer Proved by Scripture

61 *Order* —I might well have taken this discourse in an order like this to show the vanity of all conditions of men to show the vanity of ordinary lives and then the vanity of philosophic lives, sceptics, stoics but the order would not have been kept I know a little what it is, and how few people understand it No human

science can keep it Saint Thomas did not keep it Mathematics keep it but they are useless on account of their depth

62 *Preface to the first part* —To speak of those who have treated of the know ledge of self of the divisions of Charron which sadden and weary us of the con fusion of Montaigne that he was quite aware of his want of method and shunned it by jumping from subject to subject that he sought to be fashionable

His foolish project of describing himself! And this not casually and against his maxims since every one makes mistakes but by his maxims themselves and by first and chief design For to say silly things by chance and weakness is a common misfortune but to say them intentionally is intolerable and to say such as that

63 *Montaigne* —Montaigne s faults are great Lewd words this is bad notw th standing Mademoiselle de Gournay Credulous *people without eyes* Ignorant *squaring the circle a greater world* His opinions on suicide on death He suggests an indifference about salvation *without fear and without repentance* As his book was not written with a religious purpose he was not bound to mention religion but it is always our duty not to turn men from it One can excuse his rather free and licentious opinions on some relations of life but one cannot excuse his thor oughly pagan views on death for a man must renounce piety altogether, if he does not at least wish to die like a Christian Now through the whole of his book his only conception of death is a cowardly and effeminate one

64 It is not in Montaigne but in myself that I find all that I see in him

65 What good there is in Montaigne can only have been acquired with difficulty The evil that is in him I mean apart from his morality could have been corrected in a moment if he had been informed that he made too much of trifles and spoke too much of himself

66 One must know oneself If this does not serve to discover truth it at least serves as a rule of life and there is nothing better

67 *The vanity of the sciences* —Physical science will not console me for the ig norance of morality in the time of affliction But the science of ethics will always console me for the ignorance of the physical sciences

68 Men are never taught to be gentlemen and are taught everything else and they never plume themselves so much on the rest of their knowledge as on know ing how to be gentlemen They only plume themselves on knowing the one thing they do not know

69 *The infinites the mean* —When we read too fast or too slowly we understand nothing

70 *Nature* —[Nature has set us so well in the centre that if we change one side of the balance we change the other also *I act* Tὰ ζῶα τρέχει This makes me

believe that the springs in our brain are so adjusted that he who touches one touches also its contrary]

71 Too much and too little wine Give him none, he cannot find truth, give him too much, the same

72 *Man s disproportion* —[This is where our innate knowledge leads us If it be not true, there is no truth in man, and if it be true, he finds therein great cause for humiliation, being compelled to abase himself in one way or another And since he cannot exist without this knowledge, I wish that, before entering on deeper researches into nature, he would consider her both seriously and at leisure, that he would reflect upon himself also, and knowing what proportion there is] Let man then contemplate the whole of nature in her full and grand majesty, and turn his vision from the low objects which surround him Let him gaze on that brilliant light, set like an eternal lamp to illumine the universe, let the earth appear to him a point in comparison with the vast circle described by the sun, and let him wonder at the fact that this vast circle is itself but a very fine point in comparison with that described by the stars in their revolution round the firmament But if our view be arrested there, let our imagination pass beyond, it will sooner exhaust the power of conception than nature that of supplying material for conception The whole visible world is only an imperceptible atom in the ample bosom of nature No idea approaches it We may enlarge our conceptions beyond all imaginable space, we only produce atoms in comparison with the reality of things It is an infinite sphere, the centre of which is everywhere, the circumference nowhere In short, it is the greatest sensible mark of the almighty power of God that imagination loses itself in that thought

Returning to himself, let man consider what he is in comparison with all existence, let him regard himself as lost in this remote corner of nature, and from the little cell in which he finds himself lodged, I mean the universe, let him estimate at their true value the earth, kingdoms, cities, and himself What is a man in the Infinite?

But to show him another prodigy equally astonishing, let him examine the most delicate things he knows Let a mite be given him, with its minute body and parts incomparably more minute, limbs with their joints, veins in the limbs, blood in the veins, humours in the blood, drops in the humours, vapours in the drops Dividing these last things again, let him exhaust his powers of conception, and let the last object at which he can arrive be now that of our discourse ,Perhaps he will think that here is the smallest point in nature I will let him see therein a new abyss I will paint for him not only the visible universe, but all that he can conceive of nature s immensity in the womb of this abridged atom Let him see therein an infinity of universes, each of which has its firmament, its planets its earth, in the same proportion as in the visible world, in each earth animals, and in the last mites, in which he will find again all that the first had, finding still in these others the same thing without end and without cessation Let him lose himself in wonders as amazing in their littleness as the others in their vastness For who will not be astounded at the fact that our body, which a little while ago was imperceptible in the universe itself imperceptible in the bosom of the whole is now a colossus, a world, or rather a whole, in respect of the nothingness which we cannot reach?

He who regards himself in this light will be afraid of himself and observing him self sustained in the body given him by nature between those two abysses of the Infinite and Nothing will tremble at the sight of these marvels and I think that as his curiosity changes into admiration he will be more disposed to contemplate them in silence than to examine them with presumption

For in fact what is man in nature? A Nothing in comparison with the Infinite an All in comparison with the Nothing a mean between nothing and everything Since he is infinitely removed from comprehending the extremes the end of things and their beginning are hopelessly hidden from him in an impenetrable secret he is equally incapable of seeing the Nothing from which he was made and the Infinite in which he is swallowed up

What will he do then but perceive the appearance of the middle of things in an eternal despair of knowing either their beginning or their end All things proceed from the Nothing and are borne towards the Infinite Who will follow these mar vellous processes? The Author of these wonders understands them None other can do so

Through failure to contemplate these Infinites men have rashly rushed into the examination of nature as though they bore some proportion to her It is strange that they have wished to understand the beginnings of things and thence to arrive at the knowledge of the whole with a presumption as infinite as their object For surely this design cannot be formed without presumption or without a capacity infinite like nature

If we are well informed we understand that as nature has graven her image and that of her Author on all things they almost all partake of her double infinity Thus we see that all the sciences are infinite in the extent of their researches For who doubts that geometry for instance has an infinite infinity of problems to solve? They are also infinite in the multitude and fineness of their premises for it is clear that those which are put forward as ultimate are not self supporting but are based on others which again having others for their support do not permit of finality But we represent some as ultimate for reason in the same way as in regard to material objects we call that an indivisible point beyond which our senses can no longer perceive anything although by its nature it is infinitely divisible

Of these two Infinites of science that of greatness is the most palpable and hence a few persons have pretended to know all things I will speak of the whole said Democritus

But the infinitely little is the least obvious Philosophers have much oftener claimed to have reached it and it is here they have all stumbled This has given rise to such common titles as *First Principles Principles of Philosophy* and the like as ostentatious in fact though not in appearance as that one which blinds us *De omni scibili*[1]

We naturally believe ourselves far more capable of reaching the centre of things than of embracing their circumference The visible extent of the world visibly exceeds us but as we exceed little things we think ourselves more capable of knowing them And yet we need no less capacity for attaining the Nothing than the All Infinite capacity is required for both and it seems to me that whoever shall have understood the ultimate principles of being might also attain to the knowledge of the Infinite The one depends on the other and one leads to the

[1]Title given by Pico della Mirandola to one of his proposed nine hundred theses in 1486

other These extremes meet and reunite by force of distance and find each other in God, and in God alone

Let us, then, take our compass, we are something, and we are not everything The nature of our existence hides from us the knowledge of first beginnings which are born of the Nothing, and the littleness of our being conceals from us the sight of the Infinite

Our intellect holds the same position in the world of thought as our body occupies in the expanse of nature

Limited as we are in every way, this state which holds the mean between two extremes is present in all our impotence Our senses perceive no extreme Too much sound deafens us, too much light dazzles us, too great distance or proximity hinders our view Too great length and too great brevity of discourse tend to obscurity, too much truth is paralysing (I know some who cannot understand that to take four from nothing leaves nothing) First principles are too self evident for us, too much pleasure disagrees with us Too many concords are annoying in music, too many benefits irritate us, we wish to have the wherewithal to overpay our debts *Beneficia eo usque læta sunt dum videntur exsolvi posse, ubi multum antevenere, pro gratia odium redditur*[1] We feel neither extreme heat nor extreme cold Excessive qualities are prejudicial to us and not perceptible by the senses, we do not feel but suffer them Extreme youth and extreme age hinder the mind, as also too much and too little education In short, extremes are for us as though they were not, and we are not within their notice They escape us, or we them

This is our true state, this is what makes us incapable of certain knowledge and of absolute ignorance We sail within a vast sphere, ever drifting in uncertainty, driven from end to end When we think to attach ourselves to any point and to fasten to it, it wavers and leaves us, and if we follow it, it eludes our grasp, slips past us, and vanishes for ever Nothing stays for us This is our natural condition and yet most contrary to our inclination, we burn with desire to find solid ground and an ultimate sure foundation whereon to build a tower reaching to the Infinite But our whole groundwork cracks, and the earth opens to abysses

Let us, therefore, not look for certainty and stability Our reason is always deceived by fickle shadows, nothing can fix the finite between the two Infinites, which both enclose and fly from it

If this be well understood, I think that we shall remain at rest, each in the state wherein nature has placed him As this sphere which has fallen to us as our lot is always distant from either extreme, what matters it that man should have a little more knowledge of the universe? If he has it, he but gets a little higher Is he not always infinitely removed from the end, and is not the duration of our life equally removed from eternity, even if it lasts ten years longer?

In comparison with these Infinites, all finites are equal, and I see no reason for fixing our imagination on one more than on another The only comparison which we make of ourselves to the finite is painful to us

If man made himself the first object of study, he would see how incapable he is of going further How can a part know the whole? But he may perhaps aspire to know at least the parts to which he bears some proportion But the parts of the

[1]Tacitus *Annals* iv 18 Kindnesses are agreeable so long as one thinks them possible to render further recognition makes way for hatred

world are all so related and linked to one another that I believe it impossible to know one without the other and without the whole

Man for instance is related to all he knows He needs a place wherein to abide time through which to live motion in order to live elements to compose him warmth and food to nourish him air to breathe He sees light he feels bodies in short he is in a dependent alliance with everything To know man then it is necessary to know how it happens that he needs air to live and to know the air we must know how it is thus related to the life of man etc Flame can not exist without air therefore to understand the one we must understand the other

Since everything then is cause and effect dependent and supporting mediate and immediate and all is held together by a natural though imperceptible chain which binds together things most distant and most different I hold it equally impossible to know the parts without knowing the whole and to know the whole without knowing the parts in detail

[The eternity of things in itself or in God must also astonish our brief duration The fixed and constant immobility of nature in comparison with the continual change which goes on within us must have the same effect]

And what completes our incapability of knowing things is the fact that they are simple and that we are composed of two opposite natures different in kind soul and body For it is impossible that our rational part should be other than spiritual and if any one maintain that we are simply corporeal this would far more exclude us from the knowledge of things there being nothing so inconceivable as to say that matter knows itself It is impossible to imagine how it should know itself

So if we are simply material we can know nothing at all and if we are composed of mind and matter we cannot know perfectly things which are simple whether spiritual or corporeal Hence it comes that almost all philosophers have confused ideas of things and speak of material things in spiritual terms and of spiritual things in material terms For they say boldly that bodies have a tendency to fall that they seek after their centre that they fly from destruction that they fear the void that they have inclinations sympathies antipathies all of which attributes pertain only to mind And in speaking of minds they consider them as in a place and attribute to them movement from one place to another and these are qualities which belong only to bodies

Instead of receiving the ideas of these things in their purity we colour them with our own qualities and stamp with our composite being all the simple things which we contemplate

Who would not think seeing us compose all things of mind and body but that this mixture would be quite intelligible to us? Yet it is the very thing we least understand Man is to himself the most wonderful object in nature for he cannot conceive what the body is still less what the mind is and least of all how a body should be united to a mind This is the consummation of his difficulties and yet it is his very being *Modus quo corporibus adhærent spiritus comprehendi ab hominibus non potest et hoc tamen homo est* [1] Finally to complete the proof of our weakness I shall conclude with these two considerations

[1]St. Augustine *City of God* xxi 10 The manner in which the spirit is united to the body can not be understood by man and yet it is man

73 [But perhaps this subject goes beyond the capacity of reason Let us therefore examine her solutions to problems within her powers If there be anything to which her own interest must have made her apply herself most seriously, it is the inquiry into her own sovereign good Let us see, then, wherein these strong and clear sighted souls have placed it and whether they agree

One says that the sovereign good consists in virtue, another in pleasure, another in the knowledge of nature, another in truth, *Felix qui potuit rerum cognoscere causas*,[1] another in total ignorance, another in indolence, others in disregarding appearances, another in wondering at nothing, *nihil admirari prope res una quæ possit facere et servare beatum*,[2] and the true sceptics in their indifference, doubt, and perpetual suspense, and others, wiser, think to find a better definition We are well satisfied

To transpose after the laws to the following title

We must see if this fine philosophy has gained nothing certain from so long and so intent study, perhaps at least the soul will know itself Let us hear the rulers of the world on this subject What have they thought of her substance? 394 [3] Have they been more fortunate in locating her? 395 [3] What have they found out about her origin, duration, and departure? 399 [3]

Is, then, the soul too noble a subject for their feeble lights? Let us, then, abase her to matter and see if she knows whereof is made the very body which she animates and those others which she contemplates and moves at her will What have those great dogmatists, who are ignorant of nothing, known of this matter? *Harum sententiarum*,[4] 393 [3]

This would doubtless suffice, if Reason were reasonable She is reasonable enough to admit that she has been unable to find anything durable, but she does not yet despair of reaching it, she is as ardent as ever in this search, and is confident she has within her the necessary powers for this conquest We must therefore conclude, and, after having examined her powers in their effects, observe them in themselves, and see if she has a nature and a grasp capable of laying hold of the truth]

74 A letter *On the Foolishness of Human Knowledge and Philosophy*

This letter before *Diversion*

Felix qui potuit *Nihil admirari*

280 kinds of sovereign good in Montaigne

75 Part I, 1, 2, c 1, section 4 [5]

[*Probability* —It will not be difficult to put the case a stage lower, and make it appear ridiculous To begin at the very beginning] What is more absurd than to say that lifeless bodies have passions, fears, hatreds—that insensible bodies, lifeless and incapable of life, have passions which presuppose at least a sensitive soul to feel them, nay more, that the object of their dread is the void? What is there in the void that could make them afraid? Nothing is more shallow and ridiculous

[1] Virgil *Georgics* ii 489 Happy is he who is able to know the causes of things

[2] Horace *Epistles* I vi 1 To be astonished at nothing is nearly the only thing which can give and conserve happiness

[3] Montaigne *Essays* ii 12

[4] Cicero *Disputationes Tusculanae* i 11 *Harum sententiarum quae vera sit, Deus aliquis viderit* Which of these opinions is the truth a god will see

[5] *Treatise on the Vacuum*

This is not all it is said that they have in themselves a source of movement to shun the void Have they arms legs muscles nerves?

76 To write against those who made too profound a study of science Descartes

77 I cannot forgive Descartes In all his philosophy he would have been quite willing to dispense with God But he had to make Him give a fillip to set the world in motion beyond this he has no further need of God

78 Descartes useless and uncertain

79 [*Descartes* —We must say summarily This is made by figure and motion for it is true But to say what these are and to compose the machine is ridiculous For it is useless uncertain and painful And were it true we do not think all philosophy is worth one hour of pain]

80 How comes it that a cripple does not offend us but that a fool does? Be cause a cripple recognises that we walk straight whereas a fool declares that it is we who are silly if it were not so we should feel pity and not anger

Epictetus asks still more strongly Why are we not angry if we are told that we have a headache and why are we angry if we are told that we reason badly or choose wrongly ? The reason is that we are quite certain that we have not a head ache or are not lame but we are not so sure that we make a true choice So having assurance only because we see with our whole sight it puts us into suspense and surprise when another with his whole sight sees the opposite and still more so when a thousand others deride our choice For we must prefer our own lights to those of so many others and that is bold and difficult There is never this con tradiction in the feelings towards a cripple

81 It is natural for the mind to believe and for the will to love so that for want of true objects they must attach themselves to false

82 *Imagination* —It is that deceitful part in man that mi tress of error and fal sity the more deceptive that she is not always so for she would be an infallible rule of truth if she were an infallible rule of falsehood But being most generally false she gives no sign of her nature impressing the same character on the true and the false

I do not speak of fools I speak of the wisest men and it is among them that the imagination has the great gift of persuasion Reason protests in vain it can not set a true value on things

This arrogant power the enemy of reason who likes to rule and dominate it has established in man a second nature to show how all powerful she is She makes men happy and sad healthy and sick, rich and poor she compels reason to believe doubt and deny she blunts the senses or quickens them she has her fools and sages and nothing vexes us more than to see that she fills her devotees with a satisfaction far more full and entire than does reason Those who have a lively imagination are a great deal more pleased with themselves than the wise can reasonably be They look down upon men with haughtiness they argue with

boldness and confidence, others with fear and diffidence, and this gaiety of countenance often gives them the advantage in the opinion of the hearers, such favour have the imaginary wise in the eyes of judges of like nature Imagination cannot make fools wise, but she can make them happy, to the envy of reason which can only make its friends miserable, the one covers them with glory, the other with shame

What but this faculty of imagination dispenses reputation, awards respect and veneration to persons, works, laws, and the great? How insufficient are all the riches of the earth without her consent!

Would you not say that this magistrate, whose venerable age commands the respect of a whole people, is governed by pure and lofty reason, and that he judges causes according to their true nature without considering those mere trifles which only affect the imagination of the weak? See him go to sermon, full of devout zeal, strengthening his reason with the ardour of his love He is ready to listen with exemplary respect Let the preacher appear, and let nature have given him a hoarse voice or a comical cast of countenance, or let his barber have given him a bad shave, or let by chance his dress be more dirtied than usual, then however great the truths he announces, I wager our senator loses his gravity

If the greatest philosopher in the world find himself upon a plank wider than actually necessary, but hanging over a precipice, his imagination will prevail, though his reason convince him of his safety Many cannot bear the thought without a cold sweat I will not state all its effects

Every one knows that the sight of cats or rats, the crushing of a coal, etc , may unhinge the reason The tone of voice affects the wisest, and changes the force of a discourse or a poem

Love or hate alters the aspect of justice How much greater confidence has an advocate, retained with a large fee, in the justice of his cause! How much better does his bold manner make his case appear to the judges, deceived as they are by appearances! How ludicrous is reason, blown with a breath in every direction!

I should have to enumerate almost every action of men who scarce waver save under her assaults For reason has been obliged to yield, and the wisest reason takes as her own principles those which the imagination of man has everywhere rashly introduced [He who would follow reason only would be deemed foolish by the generality of men We must judge by the opinion of the majority of mankind Because it has pleased them, we must work all day for pleasures seen to be imaginary, and, after sleep has refreshed our tired reason, we must forthwith start up and rush after phantoms, and suffer the impressions of this mistress of the world This is one of the sources of error, but it is not the only one]

Our magistrates have known well this mystery Their red robes, the ermine in which they wrap themselves like furry cats, the courts in which they administer justice, the *fleurs de lis*, and all such august apparel were necessary if the physicians had not their cassocks and their mules if the doctors had not their square caps and their robes four times too wide, they would never have duped the world, which cannot resist so original an appearance If magistrates had true justice and if physicians had the true art of healing they would have no occasion for square caps, the majesty of these sciences would of itself be venerable enough But having only imaginary knowledge they must employ those silly tools that strike the imagination with which they have to deal and thereby in fact they inspire respect

Soldiers alone are not disguised in this manner because indeed their part is the most essential they establish themselves by force the others by show

Therefore our kings seek out no disguises They do not mask themselves in extraordinary costumes to appear such but they are accompanied by guards and halberdiers Those armed and red faced puppets who have hands and power for them alone those trumpets and drums which go before them and those legions round about them make the stoutest tremble They have not dress only they have might A very refined reason is required to regard as an ordinary man the Grand Turk in his superb seraglio surrounded by forty thousand janissaries

We cannot even see an advocate in his robe and with his cap on his head without a favourable opinion of his ability The imagination disposes of everything it makes beauty justice and happiness which is everything in the world I should much like to see an Italian work of which I only know the title which alone is worth many books *Della opinione regina del mondo* I approve of the book without knowing it save the evil in it if any These are pretty much the effects of that deceptive faculty which seems to have been expressly given us to lead us into necessary error We have however many other sources of error

Not only are old impressions capable of misleading us the charms of novelty have the same power Hence arise all the disputes of men who taunt each other either with following the false impressions of childhood or with running rashly after the new Who keeps the due mean? Let him appear and prove it There is no principle however natural to us from infancy which may not be made to pass for a false impression either of education or of sense

Because say some you have believed from childhood that a box was empty when you saw nothing in it you have believed in the possibility of a vacuum This is an illusion of your senses strengthened by custom which science must correct Because say others you have been taught at school that there is no vacuum you have perverted your common sense which clearly comprehended it and you must correct this by returning to your first state Which has deceived you your senses or your education?

We have another source of error in diseases They spoil the judgement and the senses and if the more serious produce a sensible change I do not doubt that slighter ills produce a proportionate impression

Our own interest is again a marvellous instrument for nicely putting out our eyes The justest man in the world is not allowed to be judge in his own cause I know some who in order not to fall into this self love have been perfectly unjust out of opposition The sure way of losing a just cause has been to get it recommended to these men by their near relatives

Justice and truth are two such subtle points that our tools are too blunt to touch them accurately If they reach the point they either crush it or lean all round more on the false than on the true

[Man is so happily formed that he has no good of the true and several excellent of the false Let us now see how much But the most powerful cause of error is the war existing between the senses and reason]

83 *We must thus begin the chapter on the deceptive powers* Man is only a subject full of error natural and ineffaceable without grace Nothing shows him the truth Everything deceives him These two sources of truth reason and the senses be

sides being both wanting in sincerity, deceive each other in turn The senses mislead the Reason with false appearances, and receive from Reason in their turn the same trickery which they apply to her, Reason has her revenge The passions of the soul trouble the senses, and make false impressions upon them They rival each other in falsehood and deception

But besides those errors which arise accidentally and through lack of intelligence, with these heterogeneous faculties

84 The imagination enlarges little objects so as to fill our souls with a fantastic estimate, and, with rash insolence, it belittles the great to its own measure, as when talking of God

85 Things which have most hold on us, as the concealment of our few possessions, are often a mere nothing It is a nothing which our imagination magnifies into a mountain Another turn of the imagination would make us discover this without difficulty

86 [My fancy makes me hate a croaker, and one who pants when eating Fancy has great weight Shall we profit by it? Shall we yield to this weight because it is natural? No, but by resisting it]

87 *Næ iste magno conatu magnas nugas dixerit* [1]

583 [2] *Quasi quidquam infelicius sit homini cui sua figmenta dominantur* [3]

88 Children who are frightened at the face they have blackened are but children But how shall one who is so weak in his childhood become really strong when he grows older? We only change our fancies All that is made perfect by progress perishes also by progress All that has been weak can never become absolutely strong We say in vain, He has grown, he has changed , he is also the same

89 Custom is our nature He who is accustomed to the faith believes in it, can no longer fear hell, and believes in nothing else He who is accustomed to believe that the king is terrible etc Who doubts, then, that our soul, being accustomed to see number, space, motion, believes that and nothing else?

90 *Quod crebro videt non miratur, etiamsi cur fiat nescit, quod ante non viderit, id si evenerit, ostentum esse censet* [4]

91 *Spongia solis* —When we see the same effect always recur, we infer a natural necessity in it, as that there will be a tomorrow, etc But Nature often deceives us, and does not subject herself to her own rules

[1]Terence, *Heauton Timorumenos* III v 8 There is one who will say great foolishness with great effort

[2]Montaigne, *Essays*, ii 12

[3]Pliny, ii 7 As though there were anyone more unhappy than a man dominated by his imagination

[4]Cicero *De Divinatione* ii 22 A common happening does not astonish even though the cause is unknown an event such as one has never seen before passes for a prodigy

92 What are our natural principles but principles of custom? In children they are those which they have received from the habits of their fathers as hunting in animals A different custom will cause different natural principles This is seen in experience and if there are some natural principles ineradicable by custom there are also some customs opposed to nature ineradicable by nature or by a second custom This depends on disposition

93 Parents fear lest the natural love of their children may fade away What kind of nature is that which is subject to decay? Custom is a second nature which destroys the former But what is nature? For is custom not natural? I am much afraid that nature is itself only a first custom as custom is a second nature

94 The nature of man is wholly natural *omne animal* [1]

There is nothing he may not make natural there is nothing natural he may not lose

95 Memory joy are intuitions and even mathematical propositions become intuitions for education produces natural intuitions and natural intuitions are erased by education

96 When we are accustomed to use bad reasons for proving natural effects we are not willing to receive good reasons when they are discovered An example may be given from the circulation of the blood as a reason why the vein swells below the ligature

97 The most important affair in life is the choice of a calling chance decides it Custom makes men masons soldiers slaters He is a good slater says one and speaking of soldiers remarks They are perfect fools But others affirm There is nothing great but war the rest of men are good for nothing We choose our callings according as we hear this or that praised or despised in our childhood for we naturally love truth and hate folly These words move us the only error is in their application So great is the force of custom that out of those whom nature has only made men are created all conditions of men For some districts are full of masons others of soldiers etc Certainly nature is not so uniform It is custom then which does this for it constrains nature But sometimes nature gains the ascendancy and preserves man s instinct in spite of all custom good or bad

98 *Bias leading to error* —It is a deplorable thing to see all men deliberating on means alone and not on the end Each thinks how he will acquit himself in his condition but as for the choice of condition or of country chance gives them to us

It is a pitiable thing to see so many Turks heretics and infidels follow the way of their fathers for the sole reason that each has been imbued with the prejudice that it is the best And that fixes for each man his condition of locksmith soldier etc

Hence savages care nothing for Providence

[1]Allusion to Gen. 7 14 *Ipsi et omne animal secundus genus suum* And every beast after his kind.

99 There is an universal and essential difference between the actions of the will and all other actions

The will is one of the chief factors in belief, not that it creates belief, but because things are true or false according to the aspect in which we look at them The will, which prefers one aspect to another, turns away the mind from considering the qualities of all that it does not like to see, and thus the mind, moving in accord with the will, stops to consider the aspect which it likes and so judges by what it sees

100 *Self love* —The nature of self love and of this human Ego is to love self only and consider self only But what will man do? He cannot prevent this object that he loves from being full of faults and wants He wants to be great, and he sees himself small He wants to be happy, and he sees himself miserable He wants to be perfect, and he sees himself full of imperfections He wants to be the object of love and esteem among men, and he sees that his faults merit only their hatred and contempt This embarrassment in which he finds himself produces in him the most unrighteous and criminal passion that can be imagined, for he conceives a mortal enmity against that truth which reproves him and which convinces him of his faults He would annihilate it, but, unable to destroy it in its essence, he destroys it as far as possible in his own knowledge and in that of others, that is to say he devotes all his attention to hiding his faults both from others and from himself, and he cannot endure either that others should point them out to him, or that they should see them

Truly it is an evil to be full of faults, but it is a still greater evil to be full of them and to be unwilling to recognise them, since that is to add the further fault of a voluntary illusion We do not like others to deceive us, we do not think it fair *that they should be held in higher esteem by us than they deserve, it is not, then,* fair that we should deceive them and should wish them to esteem us more highly than we deserve

Thus, when they discover only the imperfections and vices which we really have, it is plain they do us no wrong, since it is not they who cause them, they rather do us good, since they help us to free ourselves from an evil, namely, the ignorance of these imperfections We ought not to be angry at their knowing our faults and despising us, it is but right that they should know us for what we are and should despise us, if we are contemptible

Such are the feelings that would arise in a heart full of equity and justice What must we say then of our own heart, when we see it in a wholly different disposition? For is it not true that we hate truth and those who tell it us, and that we like them to be deceived in our favour and prefer to be esteemed by them as being other than what we are in fact? One proof of this makes me shudder The Catholic religion does not bind us to confess our sins indiscriminately to everybody, it allows them to remain hidden from all other men save one, to whom she bids us reveal the innermost recesses of our heart and show ourselves as we are There is only this one man in the world whom she orders us to undeceive, and she binds him to an inviolable secrecy, which makes this knowledge to him as if it were not Can we imagine anything more charitable and pleasant? And yet the corruption of man is such that he finds even this law harsh, and it is one of the main reasons which has caused a great part of Europe to rebel against the Church

How unjust and unreasonable is the heart of man which feels it disagreeable to be obliged to do in regard to one man what in some measure it were right to do to all men! For is it right that we should deceive men?

There are different degrees in this aversion to truth but all may perhaps be said to have it in some degree because it is inseparable from self love It is this false delicacy which makes those who are under the necessity of reproving others choose so many windings and middle courses to avoid offence They must lessen our faults appear to excuse them intersperse praises and evidence of love and esteem Despite all this the medicine does not cease to be bitter to self love It takes as little as it can always with disgust and often with a secret spite against those who administer it

Hence it happens that if any have some interest in being loved by us they are averse to render us a service which they know to be disagreeable They treat us as we wish to be treated We hate the truth and they hide it from us We desire flattery and they flatter us We like to be deceived and they deceive us

So each degree of good fortune which raises us in the world removes us farther from truth because we are most afraid of wounding those whose affection is most useful and whose dislike is most dangerous A prince may be the byword of all Europe and he alone will know nothing of it I am not astonished To tell the truth is useful to those to whom it is spoken but disadvantageous to those who tell it because it makes them disliked Now those who live with princes love their own interests more than that of the prince whom they serve and so they take care not to confer on him a benefit so as to injure themselves

This evil is no doubt greater and more common among the higher classes but the lower are not exempt from it since there is always some advantage in making men love us Human life is thus only a perpetual illusion men deceive and flatter each other No one speaks of us in our presence as he does of us in our absence Human society is founded on mutual deceit few friendships would endure if each knew what his friend said of him in his absence although he then spoke in sincerity and without passion

Man is then only disguise falsehood and hypocrisy both in himself and in regard to others He does not wish any one to tell him the truth he avoids telling it to others and all these dispositions so removed from justice and reason have a natural root in his heart

101 I set it down as a fact that if all men knew what each said of the other there would not be four friends in the world This is apparent from the quarrels which arise from the indiscreet tales told from time to time [I say further all men would be]

102 Some vices only lay hold of us by means of others and these like branches fall on removal of the trunk

103 The example of Alexander s chastity has not made so many continent as that of his drunkenness has made intemperate It is not shameful not to be as virtuous as he and it seems excusable to be no more vicious We do not believe ourselves to be exactly sharing in the vices of the vulgar when we see that we are sharing in those of great men and yet we do not observe that in these matters they

are ordinary men We hold on to them by the same end by which they hold on to the rabble, for, however exalted they are, they are still united at some point to the lowest of men They are not suspended in the air, quite removed from our society No, no, if they are greater than we, it is because their heads are higher, but their feet are as low as ours They are all on the same level, and rest on the same earth, and by that extremity they are as low as we are, as the meanest folk, as infants, and as the beasts

104 When our passion leads us to do something, we forget our duty, for example, we like a book and read it, when we ought to be doing something else Now, to remind ourselves of our duty, we must set ourselves a task we dislike, we then plead that we have something else to do and by this means remember our duty

105 How difficult it is to submit anything to the judgement of another, without prejudicing his judgement by the manner in which we submit it! If we say, "I think it beautiful," "I think it obscure," or the like, we either entice the imagination into that view, or irritate it to the contrary It is better to say nothing, and then the other judges according to what really is, that is to say, according as it then is and according as the other circumstances, not of our making, have placed it But we at least shall have added nothing, unless it be that silence also produces an effect, according to the turn and the interpretation which the other will be disposed to give it, or as he will guess it from gestures or countenance, or from the tone of the voice, if he is a physiognomist So difficult is it not to upset a judgement from its natural place, or, rather, so rarely is it firm and stable!

106 By knowing each man's ruling passion, we are sure of pleasing him, and yet each has his fancies, opposed to his true good, in the very idea which he has of the good It is a singularly puzzling fact

107 *Lustravit lampade terras* [1]—The weather and my mood have little connection I have my foggy and my fine days within me my prosperity or misfortune has little to do with the matter I sometimes struggle against luck, the glory of mastering it makes me master it gaily, whereas I am sometimes surfeited in the midst of good fortune

108 Although people may have no interest in what they are saying, we must not absolutely conclude from this that they are not lying, for there are some people who lie for the mere sake of lying

109 When we are well we wonder what we would do if we were ill, but when we are ill we take medicine cheerfully the illness persuades us to do so We have no longer the passions and desires for amusements and promenades which health gave to us, but which are incompatible with the necessities of illness Nature gives us, then, passions and desires suitable to our present state We are only troubled by the fears which we, and not nature, give ourselves for they add to the state in which we are the passions of the state in which we are not

[1] Homer *Odyssey* xviii 135

132 Methinks Cæsar was too old to set about amusing himself with conquering the world Such sport was good for Augustus or Alexander They were still young men and thus difficult to restrain But Cæsar should have been more mature

133 Two faces which resemble each other make us laugh when together by their resemblance though neither of them by itself makes us laugh

134 How useless is painting which attracts admiration by the resemblance of things the originals of which we do not admire!

135 The struggle alone pleases us not the victory We love to see animals fighting not the victor infuriated over the vanquished We would only see the victorious end and as soon as it comes we are satiated It is the same in play and the same in the search for truth In disputes we like to see the clash of opinions but not at all to contemplate truth when found To observe it with pleasure we have to see it emerge out of strife So in the passions there is pleasure in seeing the collision of two contraries but when one acquires the mastery it becomes only brutality We never seek things for themselves but for the search Likewise in plays scenes which do not rouse the emotion of fear are worthless so are extreme and hopeless misery brutal lust and extreme cruelty

136 A mere trifle consoles us for a mere trifle distresses us

137 Without examining every particular pursuit it is enough to comprehend them under diversion

138 Men naturally slaters and of all callings save in their own rooms

139 *Diversion* —When I have occasionally set myself to consider the different distractions of men the pains and perils to which they expose themselves at court or in war whence arise so many quarrels passions bold and often bad ventures etc. I have discovered that all the unhappiness of men arises from one single fact that they cannot stay quietly in their own chamber A man who has enough to live on if he knew how to stay with pleasure at home would not leave it to go to sea or to besiege a town A commission in the army would not be bought so dearly but that it is found insufferable not to budge from the town and men only seek conversation and entering games because they cannot remain with pleasure at home

But on further consideration when after finding the cause of all our ills I have sought to discover the reason of it I have found that there is one very real reason namely the natural poverty of our feeble and mortal condition so miserable that nothing can comfort us when we think of it closely

Whatever condition we picture to ourselves if we muster all the good things which it is possible to possess royalty is the finest position in the world Yet when we imagine a king attended with every pleasure he can feel if he be without diversion and be left to consider and reflect on what he is this feeble happiness will not sustain him he will necessarily fall into forebodings of dangers of revolutions

which may happen, and, finally, of death and inevitable disease, so that, if he be without what is called diversion, he is unhappy and more unhappy than the least of his subjects who plays and diverts himself

Hence it comes that play and the society of women, war and high posts, are so sought after Not that there is in fact any happiness in them, or that men imagine true bliss to consist in money won at play, or in the hare which they hunt, we would not take these as a gift We do not seek that easy and peaceful lot which permits us to think of our unhappy condition, nor the dangers of war, nor the labour of office, but the bustle which averts these thoughts of ours and amuses us

Reasons why we like the chase better than the quarry

Hence it comes that men so much love noise and stir, hence it comes that the prison is so horrible a punishment, hence it comes that the pleasure of solitude is a thing incomprehensible And it is, in fact, the greatest source of happiness in the condition of kings that men try incessantly to divert them and to procure for them all kinds of pleasures

The king is surrounded by persons whose only thought is to divert the king and to prevent his thinking of self For he is unhappy, king though he be, if he think of himself

This is all that men have been able to discover to make themselves happy And those who philosophise on the matter, and who think men unreasonable for spending a whole day in chasing a hare which they would not have bought, scarce know our nature The hare in itself would not screen us from the sight of death and calamities, but the chase, which turns away our attention from these, does screen us

The advice given to Pyrrhus, to take the rest which he was about to seek with so much labour, was full of difficulties

[To bid a man live quietly is to bid him live happily It is to advise him to be in a state perfectly happy, in which he can think at leisure without finding therein a cause of distress This is to misunderstand nature]

As men who naturally understand their own condition avoid nothing so much as rest, so there is nothing they leave undone in seeking turmoil Not that they have an instinctive knowledge of true happiness

So we are wrong in blaming them Their error does not lie in seeking excitement, if they seek it only as a diversion, the evil is that they seek it as if the possession of the objects of their quest would make them really happy In this respect it is right to call their quest a vain one Hence in all this both the censurers and the censured do not understand man s true nature]

And thus, when we take the exception against them, that what they seek with such fervour cannot satisfy them, if they replied—as they should do if they considered the matter thoroughly—that they sought in it only a violent and impetuous occupation which turned their thoughts from self, and that they therefore chose an attractive object to charm and ardently attract them, they would leave their opponents without a reply But they do not make this reply because they do not know themselves They do not know that it is the chase and not the quarry, which they seek

Dancing We must consider rightly where to place our feet —A gentleman sincerely believes that hunting is great and royal sport, but a beater is not of this opinion

They imagine that if they obtained such a post they would then rest with pleasure and are insensible of the insatiable nature of their desire They think they are truly seeking quiet and they are only seeking excitement

They have a secret instinct which impels them to seek amusement and occupation abroad and which arises from the sense of their constant unhappiness They have another secret instinct a remnant of the greatness of our original nature which teaches them that happiness in reality consists only in rest and not in stir And of these two contrary instincts they form within themselves a confused idea which hides itself from their view in the depths of their soul inciting them to aim at rest through excitement and always to fancy that the satisfaction which they have not will come to them if by surmounting whatever difficulties confront them they can thereby open the door to rest

Thus passes away all man s life Men seek rest in a struggle against difficulties and when they have conquered these rest becomes insufferable For we think either of the misfortunes we have or of those which threaten us And even if we should see ourselves sufficiently sheltered on all sides weariness of its own accord would not fail to arise from the depths of the heart wherein it has its natural roots and to fill the mind with its poison

Thus so wretched is man that he would weary even without any cause for weariness from the peculiar state of his disposition and so frivolous is he that though full of a thousand reasons for weariness the least thing such as playing billiards or hitting a ball is sufficient to amuse him

But will you say what object has he in all this? The pleasure of bragging tomorrow among his friends that he has played better than another So others sweat in their own rooms to show to the learned that they have solved a problem in algebra which no one had hitherto been able to solve Many more expose themselves to extreme perils in my opinion as foolishly in order to boast afterwards that they have captured a town Lastly others wear themselves out in studying all these things not in order to become wiser but only in order to prove that they know them and these are the most senseless of the band since they are so knowingly whereas one may suppose of the others that if they knew it they would no longer be foolish

This man spends his life without weariness in playing every day for a small stake Give him each morning the money he can win each day on condition he does not play you make him miserable It will perhaps be said that he seeks the amusement of play and not the winnings Make him then play for nothing he will not become excited over it and will feel bored It is then not the amusement alone that he seeks a languid and passionless amusement will weary him He must get excited over it and deceive himself by the fancy that he will be happy to win what he would not have as a gift on condition of not playing and he must make for himself an object of passion and excite over it his desire his anger his fear to obtain his imagined end as children are frightened at the face they have blackened

Whence comes it that this man who lost his only son a few months ago or who this morning was in such trouble through being distressed by lawsuits and quarrels now no longer thinks of them? Do not wonder he is quite taken up in looking out for the boar which his dogs have been hunting so hotly for the last six hours He requires nothing more However full of sadness a man may be he is happy for the time if you can prevail upon him to enter into some amusement and

however happy a man may be, he will soon be discontented and wretched, if he be not diverted and occupied by some passion or pursuit which prevents weariness from overcoming him Without amusement there is no joy, with amusement there is no sadness And this also constitutes the happiness of persons in high position, that they have a number of people to amuse them and have the power to keep themselves in this state

Consider this What is it to be superintendent, chancellor, first president, but to be in a condition wherein from early morning a large number of people come from all quarters to see them, so as not to leave them an hour in the day in which they can think of themselves? And when they are in disgrace and sent back to their country houses, where they lack neither wealth nor servants to help them on occasion, they do not fail to be wretched and desolate, because no one prevents them from thinking of themselves

140 [How does it happen that this man, so distressed at the death of his wife and his only son, or who has some great lawsuit which annoys him, is not at this moment sad, and that he seems so free from all painful and disquieting thoughts? We need not wonder, for a ball has been served him, and he must return it to his companion He is occupied in catching it in its fall from the roof, to win a game How can he think of his own affairs, pray, when he has this other matter in hand? Here is a care worthy of occupying this great soul and taking away from him every other thought of the mind *This man, born to know the universe, to judge all causes,* to govern a whole state, is altogether occupied and taken up with the business of catching a hare And if he does not lower himself to this and wants always to be on the strain, he will be more foolish still, because he would raise himself above humanity, *and after all, he is only a man, that is to say capable of little and of much, of all and of nothing, he is neither angel nor brute, but man*]

141 Men spend their time in following a ball or a hare it is the pleasure even of kings

142 *Diversion*—Is not the royal dignity sufficiently great in itself to make its possessor happy by the mere contemplation of what he is? Must he be diverted from this thought like ordinary folk? I see well that a man is made happy by diverting him from the view of his domestic sorrows so as to occupy *all his thoughts* with the care of dancing well But will it be the same with a king, and will he be happier in the pursuit of these idle amusements than in the contemplation of his greatness? And what more satisfactory object could be presented to his mind? Would it not be a deprivation of his delight for him to occupy his soul with the thought of how to adjust his steps to the cadence of an air, or of how to throw a [ball] skilfully, instead of leaving it to enjoy quietly the contemplation of the majestic glory which encompasses him? Let us make the trial, let us leave a king all alone to reflect on himself quite at leisure, without any gratification of the senses, without any care in his mind, without society, and we will see that a king without diversion is a man full of wretchedness So this is carefully avoided and near the persons of kings there never fail to be a great number of people who see to it that amusement follows business and who watch all the time of their leisure to supply them with delights and games so that there is no blank in it In fact kings are sur

rounded with persons who are wonderfully attentive in taking care that the king be not alone and in a state to think of himself knowing well that he will be miserable king though he be if he meditate on self

In all this I am not talking of Christian kings as Christians but only as kings

143 *Diversion* —Men are entrusted from infancy with the care of their honour their property their friends and even with the property and the honour of their friends They are overwhelmed with business with the study of languages and with physical exercise and they are made to understand that they cannot be happy unless their health their honour their fortune and that of their friends be in good condition and that a single thing wanting will make them unhappy Thus they are given cares and business which make them bustle about from break of day — It is you will exclaim a strange way to make them happy! What more could be done to make them miserable?—Indeed! what could be done? We should only have to relieve them from all these cares for then they would see themselves they would reflect on what they are whence they came whither they go and thus we cannot employ and divert them too much And this is why after having given them so much business we advise them if they have some time for relaxation to employ it in amusement in play and to be always fully occupied

How hollow and full of ribaldry is the heart of man!

144 I spent a long time in the study of the abstract sciences and was disheartened by the small number of fellow students in them When I commenced the study of man I saw that these abstract sciences are not suited to man and that I was wandering farther from my own state in examining them than others in not knowing them I pardoned their little knowledge but I thought at least to find many companions in the study of man and that it was the true study which is suited to him I have been deceived still fewer study it than geometry It is only from the want of knowing how to study this that we seek the other studies But is it not that even here is not the knowledge which man should have and that for the purpose of happiness it is better for him not to know himself?

145 [One thought alone occupies us we cannot think of two things at the same time This is lucky for us according to the world not according to God]

146 Man is obviously made to think It is his whole dignity and his whole merit and his whole duty is to think as he ought Now the order of thought is to begin with self and with its Author and its end

Now of what does the world think? Never of this but of dancing playing the lute singing making verses running at the ring etc fighting making oneself king without thinking what it is to be a king and what to be a man

147 We do not content ourselves with the life we have in ourselves and in our own being we desire to live an imaginary life in the mind of others and for this purpose we endeavour to shine We labour unceasingly to adorn and preserve this imaginary existence and neglect the real And if we possess calmness or generosity or truthfulness we are eager to make it known so as to attach these virtues to that imaginary existence We would rather separate them from ourselves to join

them to it, and we would willingly be cowards in order to acquire the reputation of being brave A great proof of the nothingness of our being, not to be satisfied with the one without the other, and to renounce the one for the other! For he would be infamous who would not die to preserve his honour

148 We are so presumptuous that we would wish to be known by all the world, even by people who shall come after, when we shall be no more, and we are so vain that the esteem of five or six neighbours delights and contents us

149 We do not trouble ourselves about being esteemed in the towns through which we pass But if we are to remain a little while there, we are so concerned How long is necessary? A time commensurate with our vain and paltry life

150 Vanity is so anchored in the heart of man that a soldier, a soldier's servant, a cook, a porter brags and wishes to have his admirers Even philosophers wish for them Those who write against it want to have the glory of having written well, and those who read it desire the glory of having read it I who write this have perhaps this desire, and perhaps those who will read it

151 *Glory*—*Admiration spoils all from infancy Ah! How well said! Ah! How* well done! How well behaved he is! etc

The children of Port Royal, who do not receive this stimulus of envy and glory, fall into carelessness

152 *Pride*—Curiosity is only vanity Most frequently we wish to know but to talk Otherwise we would not take a sea voyage in order never to talk of it, and for the sole pleasure of seeing without hope of ever communicating it

153 *Of the desire of being esteemed by those with whom we are*—Pride takes such natural possession of us in the midst of our woes, errors, etc We even lose our life with joy, provided people talk of it

Vanity play, hunting, visiting, false shame, a lasting name

154 [*I have no friends to your advantage*]

155 A true friend is so great an advantage, even for the greatest lords in order that he may speak well of them and back them in their absence, that they should do all to have one But they should choose well, for, if they spend all their efforts in the interests of fools, it will be of no use, however well these may speak of them, and these will not even speak well of them if they find themselves on the weakest side, for they have no influence, and thus they will speak ill of them in company

156 *Ferox gens, nullam esse vitam sine armis rati*[1]—They prefer death to peace, others prefer death to war

Every opinion may be held preferable to life the love of which is so strong and so natural

[1]Livy, xxxiv 17 A brutal people, for whom when they have not armour there is no life

157 Contradiction contempt for our existence to die for nothing hatred of our existence

158 *Pursuits* —The charm of fame is so great that we like every object to which it is attached even death

159 Noble deeds are most estimable when hidden When I see some of these in history they please me greatly But after all they have not been quite hidden *since they have been known* and though people have done what they could to hide them the little publication of them spoils all for what was best in them was the wish to hide them

160 Sneezing absorbs all the functions of the soul as well as work does but we do not draw therefrom the same conclusions against the greatness of man be cause it is against his will And although we bring it on ourselves it is neverthe less against our will that we sneeze It is not in view of the act itself it is for an other end And thus it is not a proof of the weakness of man and of his slavery under that action

It is not disgraceful for man to yield to pain and it is disgraceful to yield to pleasure *This is not because pain comes to us from without and we our* selves seek pleasure for it is possible to seek pain and yield to it purposely with *out this kind of baseness Whence comes it then that reason thinks it honour* able to succumb under stress of pain and disgraceful to yield to the attack of pleasure? It is because pain does not tempt and attract us It is we ourselves who choose it voluntarily and will it to prevail over us So that we are masters of the situation and in this man yields to himself But in pleasure it is man who yields to pleasure Now only mastery and sovereignty bring glory and only slavery brings shame

161 *Vanity* —How wonderful it is that a thing so evident as the vanity of the world is so little known that it is a strange and surprising thing to say that it is foolish to seek greatness?

162 He who will know fully the vanity of man has only to consider the causes and effects of love *The cause is a je ne sais quoi* (Corneille) and the effects are dreadful This *je ne sais quoi* so small an object that we cannot recognise it agitates a whole country princes armies the entire world

Cleopatra s nose had it been shorter the whole aspect of the world would have been altered

163 *Vanity* —The cause and the effects of love Cleopatra

164 He who does not see the vanity of the world is himself very vain Indeed who do not see it but youths who are absorbed in fame diversion and the thought of the future? But take away diversion and you will see them dried up with weari ness They feel then their nothingness without knowing it for it is indeed to be unhappy to be in insufferable sadness as soon as we are reduced to thinking of self and have no diversion

165 *Thoughts —In omnibus requiem quæsivi* [1] If our condition were truly happy, we would not need diversion from thinking of it in order to make ourselves happy

166 *Diversion* —Death is easier to bear without thinking of it than is the thought of death without peril

167 The miseries of human life has established all this as men have seen this, they have taken up diversion

168 *Diversion* —As men are not able to fight against death, misery, ignorance, they have taken it into their heads, in order to be happy, not to think of them at all

169 Despite these miseries, man wishes to be happy, and only wishes to be happy, and cannot wish not to be so But how will he set about it? To be happy he would have to make himself immortal, but, not being able to do so, it has occurred to him to prevent himself from thinking of death

170 *Diversion* —If man were happy, he would be the more so, the less he was diverted, like the Saints and God Yes, but is it not to be happy to have a faculty of being amused by diversion? No, for that comes from elsewhere and from without, and thus is dependent, and therefore subject to be disturbed by a thousand accidents, which bring inevitable griefs

171 *Misery* —The only thing which consoles us for our miseries is diversion, and yet this is the greatest of our miseries For it is this which principally hinders us from reflecting upon ourselves and which makes us insensibly ruin ourselves Without this we should be in a state of weariness, and this weariness would spur us to seek a more solid means of escaping from it But diversion amuses us, and leads us unconsciously to death

172 We do not rest satisfied with the present We anticipate the future as too slow in coming, as if in order to hasten its course, or we recall the past, to stop its too rapid flight So imprudent are we that we wander in the times which are not ours and do not think of the only one which belongs to us, and so idle are we that we dream of those times which are no more and thoughtlessly overlook that which alone exists For the present is generally painful to us We conceal it from our sight, because it troubles us, and, if it be delightful to us we regret to see it pass away We try to sustain it by the future and think of arranging matters which are not in our power, for a time which we have no certainty of reaching

Let each one examine his thoughts, and he will find them all occupied with the past and the future We scarcely ever think of the present, and if we think of it, it is only to take light from it to arrange the future The present is never our end The past and the present are our means, the future alone is our end So we never live but we hope to live, and as we are always preparing to be happy it is inevitable we should never be so

173 They say that eclipses foretoken misfortune, because misfortunes are com

[1] Ecclus 24 11 With all these I have sought rest

157. Contradiction; contempt for our existence, to die for nothing, hatred of our existence.

158. *Pursuits*.—The charm of fame is so great that we like every object to which it is attached, even death.

159. Noble deeds are most estimable when hidden. When I see some of these in history, they please me greatly. But after all they have not been quite hidden, since they have been known; and though people have done what they could to hide them, the little publication of them spoils all, for what was best in them was the wish to hide them.

160. Sneezing absorbs all the functions of the soul, as well as work does; but we do not draw therefrom the same conclusions against the greatness of man, because it is against his will. And although we bring it on ourselves, it is nevertheless against our will that we sneeze. It is not in view of the act itself; it is for another end. And thus it is not a proof of the weakness of man and of his slavery under that action.

It is not disgraceful for man to yield to pain, and it is disgraceful to yield to pleasure. This is not because pain comes to us from without, and we ourselves seek pleasure; for it is possible to seek pain, and yield to it purposely without this kind of baseness. Whence comes it, then, that reason thinks it honourable to succumb under stress of pain, and disgraceful to yield to the attack of pleasure? It is because pain does not tempt and attract us. It is we ourselves who choose it voluntarily and will it to prevail over us. So that we are masters of the situation; and in this man yields to himself. But in pleasure it is man who yields to pleasure. Now only mastery and sovereignty bring glory, and only slavery brings shame.

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Cleopatra's nose: had it been shorter, the whole aspect of the world would have been altered.

163. *Vanity*.—The cause and the effects of love: Cleopatra.

164. He who does not see the vanity of the world is himself very vain. Indeed who do not see it but youths who are absorbed in fame, diversion, and the thought of the future? But take away diversion, and you will see them dried up with weariness. They feel then their nothingness without knowing it; for it is indeed to be unhappy to be in insufferable sadness as soon as we are reduced to thinking of self, and have no diversion.

SECTION III

OF THE NECESSITY OF THE WAGER

184 *A letter to incite to the search after God*
And then to make people seek Him among the philosophers, sceptics, and dogmatists, who disquiet him who inquires of them

185 The conduct of God, who disposes all things kindly, is to put religion into the mind by reason, and into the heart by grace But to will to put it into the mind and heart by force and threats is not to put religion there, but terror, *terrorem potius quam religionem* [1]

186 *Nisi terrerentur et non docerentur, improba quasi dominatio videretur* (St Augustine, *Epistle* 48 or 49),[2] *Contra Mendacium ad Consentium*

187 *Order* —Men despise religion, they hate it and fear it is true To remedy this, we must begin by showing that religion is not contrary to reason, that it is venerable, to inspire respect for it, then we must make it lovable, to make good men hope it is true, finally, we must prove it is true
Venerable, because it has perfect knowledge of man, lovable because it promises the true good

188 In every dialogue and discourse, we must be able to say to those who take offence, Of what do you complain?

189 To begin by pitying unbelievers, they are wretched enough by their condition We ought only to revile them where it is beneficial, but this does them harm

190 To pity atheists who seek, for are they not unhappy enough? To inveigh against those who make a boast of it

191 And will this one scoff at the other? Who ought to scoff? And yet, the latter does not scoff at the other, but pities him

192 To reproach Milton with not being troubled, since God will reproach him

193 *Quid fiet hominibus qui minima contemnunt, majora non credunt?*[3]

194 Let them at least learn what is the religion they attack before attacking

[1] Terror which is more powerful than religion
[2] From fear that they are being led by terror without guidance domination appears tyrannical
[3] What will become of men who mistake small things and do not believe in greater?

it If this religion boasted of having a clear view of God and of posses ing it open and unveiled it would be attacking it to say that we see nothing in the world which shows it with this clearness But since on the contrary it says that men are in darkness and estranged from God that He has hidden Himself from their knowledge that this is in fact the name which He gives Himself in the Scriptures *Deus absconditus* [1] and finally if it endeavours equally to establish these two things that God has set up in the Church visible signs to make Himself known to those who should seek Him sincerely and that He has nevertheless so disguised them that He will only be perceived by those who seek Him with all their heart what advantage can they obtain when in the negligence with which they make pro fession of being in search of the truth they cry out that nothing reveals it to them and since that darkness in which they are and with which they upbraid the Church establishes only one of the things which she affirms without touching the other and very far from destroying proves her doctrine?

In order to attack it they should have protested that they had made every effort to seek Him everywhere and even in that which the Church proposes for their instruction but without satisfaction If they talked in this manner they would in truth be attacking one of her pretensions But I hope here to show that no reason able person can speak thus and I venture even to say that no one has ever done so We know well enough how those who are of this mind behave They believe they have made great efforts for their instruction when they have spent a few hours in reading some book of Scripture and have questioned some priests on the truths of the faith After that they boast of having made vain search in books and among men But verily I will tell them what I have often said that this negligence is insufferable We are not here concerned with the trifling interests of some stranger that we should treat it in this fashion the matter concerns ourselves and our all

The immortality of the soul is a matter which is of so great consequence to us and which touches us so profoundly that we must have lost all feeling to be in different as to knowing what it is All our actions and thoughts must take such different courses according as there are or are not eternal joys to hope for that it is impossible to take one step with sense and judgment unless we regulate our course by our view of this point which ought to be our ultimate end

Thus our first interest and our first duty is to enlighten ourselves on this subject whereon depends all our conduct Therefore among those who do not believe I make a vast difference between those who strive with all their power to inform themselves and those who live without troubling or thinking about it

I can have only compassion for those who sincerely bewail their doubt who regard it as the greatest of misfortunes and who sparing no effort to escape it make of this inquiry their principal and most serious occupation

But as for those who pass their life without thinking of this ultimate end of life and who for this sole reason that they do not find within themselves the lights which convince them of it neglect to seek them elsewhere and to examine thoroughly whether this opinion is one of those which people receive with credu lous simplicity or one of those which although obscure in themselves have nevertheless a solid and immovable foundation I look upon them in a manner quite different

This carelessness in a matter which concerns themselves their eternity their all

[1] Is 45.15. Thou art a God that hidest thyself

moves me more to anger than pity, it astonishes and shocks me, it is to me monstrous. I do not say this out of the pious zeal of a spiritual devotion. I expect, on the contrary, that we ought to have this feeling from principles of human interest and self love, for this we need only see what the least enlightened persons see.

We do not require great education of the mind to understand that here is no real and lasting satisfaction, that our pleasures are only vanity, that our evils are infinite, and, lastly, that death, which threatens us every moment, must infallibly place us within a few years under the dreadful necessity of being for ever either *annihilated or unhappy*.

There is nothing more real than this, nothing more terrible. Be we as heroic as we like, that is the end which awaits the noblest life in the world. Let us reflect on this and then say whether it is not beyond doubt that there is no good in this life but in the hope of another, *that we are happy only in proportion as we draw near* it, and that, as there are no more woes for those who have complete assurance of eternity, so there is no more happiness for those who have no insight into it.

Surely then it is a great evil thus to be in doubt, but it is at least an indispensable duty to seek when we are in such doubt, and thus the doubter who does not seek is altogether completely unhappy and completely wrong. And if besides this he is easy and content, professes to be so, and indeed boasts of it, if it is this state itself which is the subject of his joy and vanity, I have no words to describe so silly a creature.

How can people hold these opinions? What joy can we find in the expectation of nothing but hopeless misery? What reason for boasting that we are in impenetrable darkness? And how can it happen that the following argument occurs to a reasonable man?

I know not who put me into the world, nor what the world is, nor what I myself am. I am in terrible ignorance of everything. I know not what my body is, nor my senses, nor my soul, not even that part of me which thinks what I say, which reflects on all and on itself, and knows itself no more than the rest. I see those *frightful spaces of the universe which surround me*, and I find *myself* tied to one corner of this vast expanse, without knowing why I am put in this place rather than in another, nor why the short time which is given me to live is assigned to me at this point rather than at another of the whole eternity which was before me or which shall come after me. I see nothing but infinites on all sides, which surround me as an atom and as a shadow which endures only for an instant and returns no more. All I know is that I must soon die, but what I know least is this very death which I cannot escape.

As I know not whence I come, so I know not whither I go. I know only that, in leaving this world, I fall for ever either into annihilation or into the hands of an angry God, without knowing to which of these two states I shall be for ever assigned. Such is my state, full of weakness and uncertainty. And from all this I conclude that I ought to spend all the days of my life without caring to inquire into what must happen to me. *Perhaps I might find some solution to my doubts*, but I will not take the trouble, nor take a step to seek it; and after treating with scorn those who are concerned with this care, I will go without foresight and without fear to try the great event, and let myself be led carelessly to death, uncertain of the eternity of my future state.

Who would desire to have for a friend a man who talks in this fashion? Who

would choose him out from others to tell him of his affairs? Who would have recourse to him in affliction? And indeed to what use in life could one put him?

In truth it is the glory of religion to have for enemies men so unreasonable and their opposition to it is so little dangerous that it serves on the contrary to establish its truths For the Christian faith goes mainly to establish these two facts the corruption of nature and redemption by Jesus Christ Now I contend that if these men do not serve to prove the truth of the redemption by the holiness of their behaviour they at least serve admirably to show the corruption of nature by sentiments so unnatural

Nothing is so important to man as his own state nothing is so formidable to him as eternity and thus it is not natural that there should be men indifferent to the loss of their existence and to the perils of everlasting suffering They are quite different with regard to all other things They are afraid of mere trifles they foresee them they feel them And this same man who spends so many days and nights in rage and despair for the loss of office or for some imaginary insult to his honour is the very one who knows without anxiety and without emotion that he will lose all by death It is a monstrous thing to see in the same heart and at the same time this sensibility to trifles and this strange insensibility to the greatest objects It is an incomprehensible enchantment and a supernatural slumber which indicates as its cause an all powerful force

There must be a strange confusion in the nature of man that he should boast of being in that state in which it seems incredible that a single individual should be However experience has shown me so great a number of such persons that the fact would be surprising if we did not know that the greater part of those who trouble themselves about the matter are disingenuous and not in fact what they say They are people who have heard it said that it is the fashion to be thus daring It is what they call shaking off the yoke and they try to imitate this But it would not be difficult to make them understand how greatly they deceive themselves in thus seeking esteem This is not the way to gain it even I say among those men of the world who take a healthy view of things and who know that the only way to succeed in this life is to make ourselves appear honourable faithful judicious and capable of useful service to a friend because naturally men love only what may be useful to them Now what do we gain by hearing it said of a man that he has now thrown off the yoke that he does not believe there is a God who watches our actions that he considers himself the sole master of his conduct and that he thinks he is accountable for it only to himself? Does he think that he has thus brought us to have henceforth complete confidence in him and to look to him for consolation advice and help in every need of life? Do they profess to have delighted us by telling us that they hold our soul to be only a little wind and smoke especially by telling us this in a haughty and self satisfied tone of voice? Is this a thing to say gaily? Is it not on the contrary a thing to say sadly as the saddest thing in the world?

If they thought of it seriously they would see that this is so bad a mistake so contrary to good sense so opposed to decency and so removed in every respect from that good breeding which they seek that they would be more likely to correct than to pervert those who had an inclination to follow them And indeed make them give an account of their opinions and of the reasons which they have for doubting religion and they will say to you things so feeble and so petty that

they will persuade you of the contrary The following is what a person one day said to such a one very appositely 'If you continue to talk in this manner, you will really make me religious" And he was right, for who would not have a horror of holding opinions in which he would have such contemptible persons as companions!

Thus those who only feign these opinions would be very unhappy, if they restrained their natural feelings in order to make themselves the most conceited of men If, at the bottom of their heart, they are troubled at not having more light, let them not disguise the fact, this avowal will not be shameful The only shame is to have none Nothing reveals more an extreme weakness of mind than not to know the misery of a godless man Nothing is more indicative of a bad disposition of heart than not to desire the truth of eternal promises Nothing is more dastardly than to act with bravado before God Let them then leave these impieties to those who are sufficiently ill bred to be really capable of them Let them at least be honest men, if they cannot be Christians Finally, let them recognise that there are two kinds of people one can call reasonable, those who serve God with all their heart because they know Him, and those who seek Him with all their heart because they do not know Him

But as for those who live without knowing Him and without seeking Him, they judge themselves so little worthy of their own care, that they are not worthy of the care of others, and it needs all the charity of the religion which they despise not to despise them even to the point of leaving them to their folly But because this religion obliges us always to regard them, so long as they are in this life, as capable of the grace which can enlighten them, and to believe that they may, in a little time, be more replenished with faith than we are, and that, on the other hand, we may fall into the blindness wherein they are, we must do for them what we would they should do for us if we were in their place, and call upon them to have pity upon themselves, and to take at least some steps in the endeavour to find light Let them give to reading this some of the hours which they otherwise employ so uselessly, whatever aversion they may bring to the task, they will perhaps gain something, and at least will not lose much But as for those who bring to the task perfect sincerity and a real desire to meet with truth, those I hope will be satisfied and convinced of the proofs of a religion so divine, which I have here collected, and in which I have followed somewhat after this order

195 Before entering into the proofs of the Christian religion, I find it necessary to point out the sinfulness of those men who live in indifference to the search for truth in a matter which is so important to them, and which touches them so nearly

Of all their errors this doubtless is the one which most convicts them of foolishness and blindness, and in which it is easiest to confound them by the first glimmerings of common sense and by natural feelings

For it is not to be doubted that the duration of this life is but a moment, that the state of death is eternal, whatever may be its nature, and that thus all our actions and thoughts must take such different directions according to the state of that eternity, that it is impossible to take one step with sense and judgement unless we regulate our course by the truth of that point which ought to be our ultimate end

There is nothing clearer than this, and thus according to the principles of

reason the conduct of men is wholly unreasonable if they do not take another course

On this point therefore we condemn those who live without thought of the ultimate end of life who let themselves be guided by their own inclinations and their own pleasures without reflection and without concern and as if they could annihilate eternity by turning away their thought from it think only of making themselves happy for the moment

Yet this eternity exists and death which must open into it and threatens them every hour must in a little time infallibly put them under the dreadful necessity of being either annihilated or unhappy for ever without knowing which of these eternities is for ever prepared for them

This is a doubt of terrible consequence They are in peril of eternal woe and thereupon as if the matter were not worth the trouble they neglect to inquire whether this is one of those opinions which people receive with too credulous a facility or one of those which obscure in themselves have a very firm though hidden foundation Thus they know not whether there be truth or falsity in the matter nor whether there be strength or weakness in the proofs They have them before their eyes they refuse to look at them and in that ignorance they choose all that is necessary to fall into this misfortune if it exists to await death to make trial of it yet to be very content in this state to make profession of it and indeed to boast of it Can we think seriously of the importance of this subject without being horrified at conduct so extravagant?

This resting in ignorance is a monstrous thing and they who pass their life in it must be made to feel its extravagance and stupidity by having it shown to them so that they may be confounded by the sight of their folly For this is how men reason when they choose to live in such ignorance of what they are and without seeking enlightenment I know not they say

196 Men lack heart they would not make a friend of it

197 To be insensible to the extent of despising interesting things and to be come insensible to the point which interests us most

198 The sensibility of man to trifles and his insensibility to great things indi cates a strange inversion

199 Let us imagine a number of men in chains and all condemned to death where some are killed each day in the sight of the others and those who remain see their own fate in that of their fellows and wait their turn looking at each other sorrowfully and without hope It is an image of the condition of men

200 A man in a dungeon ignorant whether his sentence be pronounced and having only one hour to learn it but this hour enough if he knew that it is pro *nounced to obtain its repeal* would act *unnaturally in* spending that hour not in ascertaining his sentence but in playing piquet So it is against nature that man etc It is making heavy the hand of God

Thus not only the zeal of those who seek Him proves God but also the blind ness of those who seek Him not

201 All the objections of this one and that one only go against themselves, and not against religion All that infidels say

202 [From those who are in despair at being without faith, we see that God does not enlighten them, but as to the rest, we see there is a God who makes them blind]

203 *Fascinatio nugacitatis*[1]—That passion may not harm us, let us act as if we had only eight hours to live

204 If we ought to devote eight hours of life, we ought to devote a hundred years

205 When I consider the short duration of my life, swallowed up in the eternity before and after, the little space which I fill and even can see, engulfed in the infinite immensity of spaces of which I am ignorant and which know me not, I am frightened and am astonished at being here rather than there, for there is no reason why here rather than there, why now rather than then Who has put me here? By whose order and direction have this place and time been allotted to me? *Memoria hospitis unius diei prætereuntis*[2]

206 The eternal silence of these infinite spaces frightens me

207 How many kingdoms know us not!

208 Why is my knowledge limited? Why my stature? Why my life to one hundred years rather than to a thousand? What reason has nature had for giving me such, and for choosing this number rather than another in the infinity of those from which there is no more reason to choose one than another, trying nothing else?

209 Art thou less a slave by being loved and favoured by thy master? Thou art indeed well off, slave Thy master favours thee, he will soon beat thee

210 The last act is tragic, however happy all the rest of the play is, at the last a little earth is thrown upon our head, and that is the end for ever

211 We are fools to depend upon the society of our fellow men Wretched as we are, powerless as we are, they will not aid us, we shall die alone We should therefore act as if we were alone, and in that case should we build fine houses, etc We should seek the truth without hesitation, and, if we refuse it, we show that we value the esteem of men more than the search for truth

212 *Instability*—It is a horrible thing to feel all that we possess slipping away

213 Between us and heaven or hell there is only life, which is the frailest thing in the world

[1]Wisd of Sol 4 12 Bewitching of naughtiness
[2]Wisd of Sol 5 15 The remembrance of a guest that tarrieth but a day

214 *Injustice*.—That presumption should be joined to meanness is extreme injustice

215 To fear death without danger and not in danger for one must be a man

216 Sudden death alone is feared hence confessors stay with lords

217 An heir finds the title deeds of his house Will he say Perhaps they are forged and neglect to examine them?

218 *Dungeon*.—I approve of not examining the opinion of Copernicus but this ! It concerns all our life to know whether the soul be mortal or immortal

219 It is certain that the mortality or immortality of the soul must make an entire difference to morality And yet philosophers have constructed their ethics independently of this they discuss to pass an hour

Plato to incline to Christianity

220 The fallacy of philosophers who have not discussed the immortality of the soul The fallacy of their dilemma in Montaigne

221 Atheists ought to say what is perfectly evident now it is not perfectly evident that the soul is material

222 *Atheists*.—What reason have they for saying that we cannot rise from the dead? What is more difficult to be born or to rise again that what has never been should be or that what has been should be again? Is it more difficult to come into existence than to return to it? Habit makes the one appear easy to us want of habit makes the other impossible A popular way of thinking!

Why cannot a virgin bear a child? Does a hen not lay eggs without a cock? What distinguishes these outwardly from others? And who has told us that the hen may not form the germ as well as the cock?

223 What have they to say against the resurrection and against the child bearing of the Virgin? Which is the more difficult to produce a man or an animal or to reproduce it? And if they had never seen any species of animals could they have conjectured whether they were produced without connection with each other?

224 How I hate these follies of not believing in the Eucharist etc ! If the Gospel be true if Jesus Christ be God what difficulty is there?

225 Atheism shows strength of mind but only to a certain degree

226 Infidels who profess to follow reason ought to be exceedingly strong in reason What say they then? Do we not see say they that the brutes live and die like men and Turks like Christians? They have their ceremonies their prophets their doctors their saints their monks like us etc (Is this contrary to Scripture? Does it not say all this?)

If you care but little to know the truth, here is enough of it to leave you in repose But if you desire with all your heart to know it, it is not enough, look at it in detail This would be sufficient for a question in philosophy, but not here, *where it concerns your all* And yet, after a *trifling reflection* of this kind, we go to amuse ourselves, etc Let us inquire of this same religion whether it does not give a reason for this obscurity, perhaps it will teach it to us

227 *Order by dialogues* —What ought I to do? I see only darkness everywhere Shall I believe I am nothing? Shall I believe I am God?

All things change and succeed each other You are mistaken, there is

228 Objection of atheists But we have no light '

229 This is what I see and what troubles me I look on all sides, and I see only darkness everywhere Nature presents to me nothing which is not matter of doubt and concern If I saw nothing there which revealed a Divinity, I would come to a negative conclusion, if I saw everywhere the signs of a Creator, I would remain peacefully in faith But, seeing too much to deny and too little to be sure, I am in a state to be pitied, wherefore I have a hundred times wished that if a God maintains Nature, she should testify to Him unequivocally, and that, if the signs she gives are deceptive, *she should suppress them altogether*, that she should say everything or nothing, that I might see which cause I ought to follow Whereas in my present state, ignorant of what I am or of what I ought to do, I know neither my condition nor my duty My heart inclines wholly to know where is the true good, in order to follow it, nothing would be too dear to me for eternity

I envy those whom I see *living in the faith with such carelessness* and who make such a bad use of a gift of which it seems to me I would make such a different use

230 It is incomprehensible that God should exist, and it is incomprehensible that He should not exist, that the soul should be joined to the body, and that we should have no soul, that the world should be created, and that it should not be created, etc , that original sin should be, and that it should not be

231 Do you believe it to be impossible that God is infinite, without parts? Yes I wish therefore to show you an infinite and indivisible thing It is a point moving everywhere with an *infinite* velocity, for it is one in all places and is all totality in every place

Let this effect of nature, which previously seemed to you impossible, make you know that there may be others of which you are still ignorant Do not draw this conclusion from your experiment, that there remains nothing for you to know, but rather that there remains an infinity for you to know

232 Infinite movement, the point which fills everything, the moment of rest, infinite without quantity, indivisible and *infinite*

233 *Infinite—nothing* —Our soul is cast into a body, where it finds number, time, dimension Thereupon it reasons, and calls this nature necessity, and can believe nothing else

Unity joined to infinity adds nothing to it no more than one foot to an infinite measure The finite is annihilated in the presence of the infinite and becomes a pure nothing So our spirit before God so our justice before divine justice There is not so great a disproportion between our justice and that of God as between unity and infinity

The justice of God must be vast like His compassion Now justice to the outcast is less vast and ought less to offend our feelings than mercy towards the elect

We know that there is an infinite and are ignorant of its nature As we know it to be false that numbers are finite it is therefore true that there is an infinity in number But we do not know what it is It is false that it is even it is false that it is odd for the addition of a unit can make no change in its nature Yet it is a number and every number is odd or even (this is certainly true of every finite number) So we may well know that there is a God without knowing what He is Is there not one substantial truth seeing there are so many things which are not the truth itself?

We know then the existence and nature of the finite because we also are finite and have extension We know the existence of the infinite and are ignorant of its nature because it has extension like us but not limits like us But we know neither the existence nor the nature of God because He has neither extension nor limits

But by faith we know His existence in glory we shall know His nature Now I have already shown that we may well know the existence of a thing without knowing its nature

Let us now speak according to natural lights

If there is a God He is infinitely incomprehensible since having neither parts nor limits He has no affinity to us We are then incapable of knowing either what He is or if He is This being so who will dare to undertake the decision of the question? Not we who have no affinity to Him

Who then will blame Christians for not being able to give a reason for their belief since they profess a religion for which they cannot give a reason? They declare in expounding it to the world that it is a foolishness *stultitiam* [1] and then you complain that they do not prove it! If they proved it they would not keep their word it is in lacking proofs that they are not lacking in sense Yes but although this excuses those who offer it as such and takes away from them the blame of putting it forward without reason it does not excuse those who receive it Let us then examine this point and say God is or He is not But to which side shall we incline? Reason can decide nothing here There is an infinite chaos which separated us A game is being played at the extremity of this infinite distance where heads or tails will turn up What will you wager? According to reason you can do neither the one thing nor the other according to reason you can defend neither of the propositions

Do not then reprove for error those who have made a choice for you know nothing about it No but I blame them for having made not this choice but a choice for again both he who chooses heads and he who chooses tails are equally at fault they are both in the wrong The true course is not to wager at all

Yes but you must wager It is not optional You are embarked Which will you

[1] 1 Cor 1 21

choose then? Let us see Since you must choose, let us see which interests you least You have two things to lose, the true and the good, and two things to stake, your reason and your will, your knowledge and your happiness, and your nature has two things to shun, error and misery Your reason is no more shocked in choosing one rather than the other, since you must of necessity choose This is one point settled But your happiness? Let us weigh the gain and the loss in wagering that God is Let us estimate these two chances If you gain, you gain all, if you lose, you lose nothing Wager, then, without hesitation that He is That is very fine Yes, I must wager, but I may perhaps wager too much " Let us see Since there is an equal risk of gain and of loss, if you had only to gain two lives, instead of one, you might still wager But if there were three lives to gain, you would have to play (since you are under the necessity of playing), and you would be imprudent, when you are forced to play, not to chance your life to gain three at a game where there is an equal risk of loss and gain But there is an eternity of life and happiness And this being so, if there were an infinity of chances, of which one only would be for you, you would still be right in wagering one to win two, and you would act stupidly, being obliged to play, by refusing to stake one life against three at a game in which out of an infinity of chances there is one for you, if there were an infinity of an infinitely happy life to gain But there is here an infinity of an infinitely happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite It is all divided, wherever the infinite is and there is not an infinity of chances of loss against that of gain, there is no time to hesitate, you must give all And thus, when one is forced to play, he must renounce reason to preserve his life, rather than risk it for infinite gain, as likely to happen as the loss of nothingness

For it is no use to say it is uncertain if we will gain, and it is certain that we risk, and that the infinite distance between the *certainty* of what is staked and the *uncertainty* of what will be gained, equals the finite good which is certainly staked against the uncertain infinite It is not so, as every player stakes a certainty to gain an uncertainty, and yet he stakes a finite certainty to gain a finite uncertainty, without transgressing against reason There is not an infinite distance between the certainty staked and the uncertainty of the gain, that is untrue In truth, there is an infinity between the certainty of gain and the certainty of loss But the uncertainty of the gain is proportioned to the certainty of the stake according to the proportion of the chances of gain and loss Hence it comes that, if there are as many risks on one side as on the other, the course is to play even, and then the certainty of the stake is equal to the uncertainty of the gain, so far is it from fact that there is an infinite distance between them And so our proposition is of infinite force, when there is the finite to stake in a game where there are equal risks of gain and of loss, and the infinite to gain This is demonstrable, and if men are capable of any truths, this is one

I confess it, I admit it But, still, is there no means of seeing the faces of the cards? ' Yes, Scripture and the rest, etc Yes, but I have my hands tied and my mouth closed, I am forced to wager, and am not free I am not released, and am so made that I cannot believe What, then, would you have me do?

True But at least learn your inability to believe, since reason brings you to this, and yet you cannot believe Endeavour, then, to convince yourself, not by increase of proofs of God, but by the abatement of your passions You would like

to attain faith and do not know the way you would like to cure yourself of unbelief and ask the remedy for it Learn of those who have been bound like you and who now stake all their possessions These are people who know the way which you would follow and who are cured of an ill of which you would be cured Follow the way by which they began by acting as if they believed taking the holy water having masses said etc Even this will naturally make you believe and deaden your acuteness But this is what I am afraid of And why? What have you to lose?

But to show you that this leads you there it is this which will lessen the passions which are your stumbling blocks

The end of this discourse —Now what harm will befall you in taking this side? You will be faithful honest humble grateful generous a sincere friend truthful Certainly you will not have those poisonous pleasures glory and luxury but will you not have others? *I will tell you that you will thereby gain in this life and that* at each step you take on this road you will see so great certainty of gain so much nothingness in what you risk that you will at last recognise that you have wagered for something certain and infinite for which you have given nothing

Ah! This discourse transports me charms me etc

If this discourse pleases you and seems impressive know that it is made by a man who has knelt both before and after it in prayer to that Being infinite and without parts before whom he lays all he has for you also to lay before Him all you have for your own good and for His glory that so strength may be given to lowliness

234 If we must not act save on a certainty we ought not to act on religion for it is not certain But how many things we do on an uncertainty sea voyages battles! I say then we must do nothing at all for nothing is certain and that there is more certainty in religion than there is as to whether we may see to morrow For it is not certain that we may see to morrow and it is certainly possible that we may not see it We cannot say as much about religion It is not certain that it is but who will venture to say that it is certainly possible that it is not? Now when we work for to morrow and so on an uncertainty we act reasonably for we ought to work for an uncertainty according to the doctrine of chance which was demonstrated above

Saint Augustine has seen that we work for an uncertainty on sea in battle etc But he has not seen the doctrine of chance which proves that we should do so Montaigne has seen that we are shocked at a fool and that habit is all powerful, but he has not seen the reason of this effect

All these persons have seen the effects but they have not seen the causes They are in comparison with those who have discovered the causes as those who have only eyes are in comparison with those who have intellect For the effects are perceptible by sense and the causes are visible only to the intellect And although these effects are seen by the mind this mind is in comparison with the mind which sees the causes as the bodily senses are in comparison with the intellect

235 *Rem viderunt causam non viderunt* [1]

[1] They have seen the thing they have not seen the cause St. Augustine *Contra Pelagium* iv 60.

236 According to the doctrine of chance, you ought to put yourself to the trouble of searching for the truth, for if you die without worshipping the True Cause, you are lost ' But, say you, if He had wished me to worship Him, He would have left me signs of His will He has done so, but you neglect them Seek them, therefore, it is well worth it

237 *Chances* —We must live differently in the world, according to these different assumptions (1) that we could always remain in it, (2) that it is certain that we shall not remain here long, and uncertain if we shall remain here one hour This last assumption is our condition

238 What do you then promise me, in addition to certain troubles, but ten years of self love (for ten years is the chance), to try hard to please without success?

239 *Objection* —Those who hope for salvation are so far happy, but they have as a counterpoise the fear of hell

Reply —Who has most reason to fear hell he who is in ignorance whether there is a hell, and who is certain of damnation if there is, or he who certainly believes there is a hell and hopes to be saved if there is?

240 'I would soon have renounced pleasure, say they ' had I faith ' For my part I tell you, You would soon have faith, if you renounced pleasure ' Now, it is for you to begin If I could, I would give you faith I cannot do so, nor therefore test the truth of what you say But you can well renounce pleasure and test whether what I say is true

241 *Order* —I would have far more fear of being mistaken, and of finding that the Christian religion was true, than of not being mistaken in believing it true

SECTION IV

OF THE MEANS OF BELIEF

242 *Preface to the second part* —To speak of those who have treated of this matter

I admire the boldness with which these persons undertake to speak of God In addressing their argument to infidels their first chapter is to prove Divinity from the works of nature I should not be astonished at their enterprise, if they were addressing their argument to the faithful, for it is certain that those who have the living faith in their hearts see at once that all existence is none other than the work of the God whom they adore But for those in whom this light is extinguished, and in whom we purpose to rekindle it, persons destitute of faith and grace, who, seeking with all their light whatever they see in nature that can bring them to this knowledge, find only obscurity and darkness, to tell them that they have only to look at the smallest things which surround them, and they will see God openly,

to give them as a complete proof of this great and important matter the course of the moon and planets and to claim to have concluded the proof with such an argument is to give them ground for believing that the proofs of our religion are very weak And I see by reason and experience that nothing is more calculated to arouse their contempt

It is not after this manner that Scripture speaks which has a better knowledge of the things that are of God It says on the contrary that God is a hidden God and that since the corruption of nature He has left men in a darkness from which they can escape only through Jesus Christ without whom all communion with God is cut off *Nemo novit Patrem nisi Filius et cui voluerit Filius revelare* [1]

This is what Scripture points out to us when it says in so many places that those who seek God find Him It is not of that light like the noonday sun that this is said We do not say that those who seek the noonday sun or water in the sea shall find them and hence the evidence of God must not be of this nature So it tells us elsewhere *Vere tu es Deus absconditus* [2]

243 It is an astounding fact that no canonical writer has ever made use of nature to prove God They all strive to make us believe in Him David Solomon etc have never said There is no void therefore there is a God They must have had more knowledge than the most learned people who came after them and who have all made use of this argument This is worthy of attention

244 Why! Do you not say yourself that the heavens and birds prove God? No And does your religion not say so ? No For although it is true in a sense for some souls to whom God gives this light yet it is false with respect to the majority of men

245 There are three sources of belief reason custom inspiration The Christian religion which alone has reason does not acknowledge as her true children those who believe without inspiration It is not that she excludes reason and custom On the contrary the mind must be opened to proofs must be confirmed by custom and offer itself in humbleness to inspirations which alone can produce a true and saving effect *Ne evacuetur crux Christi* [3]

246 *Order* —After the letter *That we ought to seek God* to write the letter *On removing obstacles* which is the discourse on the machine on preparing the machine on seeking by reason

247 *Order* —A letter of exhortation to a friend to induce him to seek And he will reply But what is the use of seeking? Nothing is seen Then to reply to him Do not despair And he will answer that he would be glad to find some light but that according to this very religion if he believed in it it will be of no use to him and that therefore he prefers not to seek And to answer to that The machine

[1] Matt xi 27 Neither knoweth any man the Father save the Son and he to whomsoever the Son will reveal him

[2] Is 45 15 Verily thou art a God that hidest thyself

[3] I Cor i 17 Lest the cross of Christ should be made of none effect

248 *A letter which indicates the use of proofs by the machine* —Faith is different from proof, the one is human, the other is a gift of God *Justus ex fide vivit*[1] It is this faith that God Himself puts into the heart, of which the proof is often the instrument, *fides ex auditu*,[2] but this faith is in the heart, and makes us not say *scio*, but *credo*[3]

249 It is superstition to put one s hope in formalities, but it is pride to be unwilling to submit to them

250 The external must be joined to the internal to obtain anything from God, that is to say, we must kneel, pray with the lips, etc , in order that proud man, who would not submit himself to God, may be now subject to the creature To expect help from these externals is superstition, to refuse to join them to the internal is pride

251 Other religions, as the pagan, are more popular, for they consist in externals But they are not for educated people A purely intellectual religion would be more suited to the learned, but it would be of no use to the common people The Christian religion alone is adapted to all, being composed of externals and internals It raises the common people to the internal, and humbles the proud to the external, it is not perfect without the two, for the people must understand the spirit of the letter, and the learned must submit their spirit to the letter

252 For we must not misunderstand ourselves, we are as much automatic as intellectual, and hence it comes that the instrument by which conviction is attained is not demonstrated alone How few things are demonstrated! Proofs only convince the mind Custom is the source of our strongest and most believed proofs It bends the automaton, which persuades the mind without its thinking about the matter Who has demonstrated that there will be a to morrow and that we shall die? And what is more believed? It is, then, custom which persuades us of it, it is custom that makes so many men Christians, custom that makes them Turks, heathens, artisans, soldiers, etc (Faith in baptism is more received among Christians than among Turks) Finally, we must have recourse to it when once the mind has seen where the truth is, in order to quench our thirst, and steep ourselves in that belief, which escapes us at every hour, for always to have proofs ready is too much trouble We must get an easier belief, which is that of custom, which, without violence, without art, without argument, makes us believe things and inclines all our powers to this belief, so that our soul falls naturally into it It is not enough to believe only by force of conviction, when the automaton is inclined to believe the contrary Both our parts must be made to believe, the mind by reasons which it is sufficient to have seen once in a lifetime, and the automaton by custom, and by not allowing it to incline to the contrary *Inclina cor meum, Deus*[4]

The reason acts slowly, with so many examinations and on so many principles, which must be always present, that at every hour it falls asleep, or wanders, through want of having all its principles present Feeling does not act thus, it acts in a

[1] Rom 1 17 The just shall live by faith
[2] Rom 10 17 Faith cometh by hearing
[3] I know I believe
[4] Ps 119 36 Incline my heart O Lord

moment and is always ready to act We must then put our faith in feeling other wise it will be always vacillating

253 Two extremes to exclude reason to admit reason only

254 It is not a rare thing to have to reprove the world for too much docility It is a natural vice like credulity and as pernicious Superstition

255 Piety is different from superstition

To carry piety as far as superstition is to destroy it

The heretics reproach us for this superstitious submission This is to do what they reproach us for

Infidelity not to believe in the Eucharist because it is not seen

Superstition to believe propositions Faith etc

256 I say there are few true Christians even as regards faith There are many who believe but from superstition There are many who do not believe solely from wickedness Few are between the two

In this I do not include those who are of truly pious character nor all those who believe from a feeling in their heart

257 There are only three kinds of persons those who serve God having found Him others who are occupied in seeking Him not having found Him while the remainder live without seeking Him and without having found Him The first are reasonable and happy the last are foolish and unhappy those between are unhappy and reasonable

258 *Unusquisque sibi Deum fingit*[1]

Disgust

259 Ordinary people have the power of not thinking of that about which they do not wish to think Do not meditate on the passages about the Messiah said the Jew to his son Thus our people often act Thus are false religions preserved and even the true one in regard to many persons

But there are some who have not the power of thus preventing thought and who think so much the more as they are forbidden These undo false religions and even the true one if they do not find solid arguments

260 They hide themselves in the press and call numbers to their rescue Tumult

Authority—So far from making it a rule to believe a thing because you have heard it you ought to believe nothing without putting yourself into the position as if you had never heard it

It is your own assent to yourself and the constant voice of your own reason and not of others that should make you believe

Belief is so important! A hundred contradictions might be true If antiquity were the rule of belief men of ancient time would then be without rule If general consent if men had perished?

[1]Wisd of Sol. 15 8 16 He moulds a God like unto himself

False humanity, pride

Lift the curtain You try in vain, if you must either believe, or deny, or doubt Shall we then have no rule? We judge that animals do well what they do Is there no rule whereby to judge men?

To deny, to believe, and to doubt well, are to a man what the race is to a horse

Punishment of those who sin, error

261 Those who do not love the truth take as a pretext that it is disputed, and that a multitude deny it And so their error arises only from this, that they do not love either truth or charity Thus they are without excuse

262 Superstition and lust Scruples, evil desires Evil fear, fear, not such as comes from a belief in God, but such as comes from a doubt whether He exists or not True fear comes from faith, false fear comes from doubt True fear is joined to hope, because it is born of faith, and because men hope in the God in whom they believe False fear is joined to despair, because men fear the God in whom they have no belief The former fear to lose Him, the latter fear to find Him

263 ' A miracle, says one, ' would strengthen my faith " He says so when he does not see one Reasons, seen from afar, appear to limit our view, but when they are reached, we begin to see beyond Nothing stops the nimbleness of our mind There is no rule, say we, which has not some exceptions, no truth so general which has not some aspect in which it fails It is sufficient that it be not absolutely universal to give us a pretext for applying the exceptions to the present subject and for saying, 'This is not always true, there are therefore cases where it is not so ' It only remains to show that this is one of them, and that is why we are very awkward or unlucky, if we do not find one some day

264 We do not weary of eating and sleeping every day, for hunger and sleepiness recur Without that we should weary of them So, without the hunger for spiritual things, we weary of them Hunger after righteousness, the eighth beatitude

265 Faith indeed tells what the senses do not tell, but not the contrary of what they see It is above them and not contrary to them

266 How many stars have telescopes revealed to us which did not exist for our philosophers of old! We freely attack Holy Scripture on the great number of stars, saying, There are only one thousand and twenty eight, we know it ' There is grass on the earth, we see it—from the moon we would not see it—and on the grass are leaves, and in these leaves are small animals, but after that no more O presumptuous man! The compounds are composed of elements, and the elements not O presumptuous man! Here is a fine reflection We must not say that there is anything which we do not see We must then talk like others, but not think like them

267 The last proceeding of reason is to recognise that there is an infinity of

things which are beyond it It is but feeble if it does not see so far as to know this But if natural things are beyond it, what will be said of supernatural?

268 *Submission* —We must know where to doubt where to feel certain where to submit He who does not do so understands not the force of reason There are some who offend against these three rules either by affirming everything as demonstrative from want of knowing what demonstration is or by doubting everything from want of knowing where to submit or by submitting in every thing from want of knowing where they must judge

269 Submission is the use of reason in which consists true Christianity

270 *Saint Augustine* —Reason would never submit if it did not judge that there are some occasions on which it ought to submit It is then right for it to submit when it judges that it ought to submit

271 Wisdom sends us to childhood *Nisi efficiamini sicut parvuli* [1]

272 There is nothing so conformable to reason as this disavowal of reason

273 If we submit everything to reason our religion will have no mysterious and supernatural element If we offend the principles of reason our religion will be absurd and ridiculous

274 All our reasoning reduces itself to yielding to feeling
But fancy is like though contrary to feeling so that we cannot distinguish between these contraries One person says that my feeling is fancy another that his fancy is feeling We should have a rule Reason offers itself but it is pliable in every sense and thus there is no rule

275 Men often take their imagination for their heart and they believe they are converted as soon as they think of being converted

276 M de Roannez said Reasons come to me afterwards but at first a thing pleases or shocks me without my knowing the reason and yet it shocks me for that reason which I only discover afterwards But I believe not that it shocked him for the reasons which were found afterwards but that these reasons were only found because it shocked him

277 The heart has its reasons which reason does not know We feel it in a thousand things I say that the heart naturally loves the Universal Being and also itself naturally according as it gives itself to them and it hardens itself against one or the other at its will You have rejected the one and kept the other Is it by reason that you love yourself?

278 It is the heart which experiences God and not the reason This then is faith God felt by the heart not by the reason

[1] Matt 18.3 Except ye become as little children

Faith is a gift of God, do not believe that we said it was a gift of reasoning Other religions do not say this of their faith They only give reasoning in order to arrive at it, and yet it does not bring them to it

279 Faith is a gift of God, do not believe that we said it was a gift of reasoning Other religions do not say this of their faith They only gave reasoning in order to arrive at it, and yet it does not bring them to it

280 The knowledge of God is very far from the love of Him

281 Heart, instinct, principles

282 We know truth, not only by the reason, but also by the heart, and it is in this last way that we know first principles, and reason, which has no part in it, tries in vain to impugn them The sceptics, who have only this for their object, labour to no purpose We know that we do not dream, and, however impossible it is for us to prove it by reason, this inability demonstrates only the weakness of our reason, but not, as they affirm, the uncertainty of all our knowledge For the knowledge of first principles, as space, time, motion, number, is as sure as any of those which we get from reasoning And reason must trust these intuitions of the heart, and must base them on every argument (We have intuitive knowledge of the tri dimensional nature of space and of the infinity of number, and reason then shows that there are no two square numbers one of which is double of the other Principles are intuited, propositions are inferred, all with certainty, though in different ways) And it is as useless and absurd for reason to demand from the heart proofs of her first principles, before admitting them, as it would be for the heart to demand from reason an intuition of all demonstrated propositions before accepting them

This inability ought, then, to serve only to humble reason, which would judge all, but not to impugn our certainty, as if only reason were capable of instructing us Would to God, on the contrary, that we had never need of it and that we knew everything by instinct and intuition! But nature has refused us this boon On the contrary, she has given us but very little knowledge of this kind, and all the rest can be acquired only by reasoning

Therefore, those to whom God has imparted religion by intuition are very fortunate and justly convinced But to those who do not have it, we can give it only by reasoning, waiting for God to give them spiritual insight, without which faith is only human and useless for salvation

283 *Order —Against the objection that Scripture has no order*

The heart has its own order, the intellect has its own, which is by principle and demonstration The heart has another We do not prove that we ought to be loved by enumerating in order the causes of love, that would be ridiculous

Jesus Christ and Saint Paul employ the rule of love, not of intellect, for they would warm, not instruct It is the same with Saint Augustine This order consists chiefly in digressions on each point to indicate the end, and keep it always in sight

284 Do not wonder to see simple people believe without reasoning God imparts

to them love of Him and hatred of self He inclines their heart to believe Men will never believe with a saving and real faith unless God inclines their heart and they will believe as soon as He inclines it And this is what David knew well when he said *Inclina cor meum Deus in* [1]

285 Religion is suited to all kinds of minds Some pay attention only to its establishment and this religion is such that its very establishment suffices to prove its truth Others trace it even to the apostles The more learned go back to the beginning of the world The angels see it better still and from a more distant time

286 Those who believe without having read the Testaments do so because they have an inward disposition entirely holy and all that they hear of our religion conforms to it They feel that a God has made them they desire only to love God, they desire to hate themselves only They feel that they have no strength in themselves that they are incapable of coming to God and that if God does not come to them they can have no communion with Him And they hear our religion say that men must love God only and hate self only but that all being corrupt and unworthy of God God made Himself man to unite Himself to us No more is required to persuade men who have this disposition in their heart and who have this knowledge of their duty and of their inefficiency

287 Those whom we see to be Christians without the knowledge of the prophets and evidences nevertheless judge of their religion as well as those who have that knowledge They judge of it by the heart as others judge of it by the intellect God Himself inclines them to believe and thus they are most effectively convinced

I confess indeed that one of those Christians who believe without proofs will not perhaps be capable of convincing an infidel who will say the same of himself But those who know the proofs of religion will prove without difficulty that such a believer is truly inspired by God though he cannot prove it himself

For God having said in His prophecies (which are undoubtedly prophecies) that in the reign of Jesus Christ He would spread His spirit abroad among nations and that the youths and maidens and children of the Church would prophesy it is certain that the Spirit of God is in these and not in the others

288 Instead of complaining that God had hidden Himself you will give Him thanks for not having revealed so much of Himself and you will also give Him thanks for not having revealed Himself to haughty sages unworthy to know so holy a God

Two kinds of persons know Him those who have a humble heart and who love lowliness whatever kind of intellect they may have high or low and those who have sufficient understanding to see the truth whatever opposition they may have to it

289 *Proof*—1 The Christian religion by its establishment having established itself so strongly so gently whilst so contrary to nature 2 The sanctity the dig

[1] Ps 119 36 Incline my heart O Lord unto thy testimonies

nity, and the humility of a Christian soul 3 The miracles of Holy Scripture 4 Jesus Christ in particular 5 The apostles in particular 6 Moses and the prophets in particular 7 The Jewish people 8 The prophecies 9 Perpetuity, no religion has perpetuity 10 The doctrine which gives a reason for everything 11 The sanctity of this law 12 By the course of the world

Surely, after considering what is life and what is religion, we should not refuse to obey the inclination to follow it, if it comes into our heart, and it is certain that there is no ground for laughing at those who follow it

290 *Proofs of religion* —Morality, doctrine, miracles, prophecies, types

SECTION V

JUSTICE AND THE REASON OF EFFECTS

291 In the letter *On Injustice* can come the ridiculousness of the law that the elder gets all 'My friend, you were born on this side of the mountain, it is therefore just that your elder brother gets everything '

"Why do you kill me ?

292 He lives on the other side of the water

293 ' Why do you kill me? What! do you not live on the other side of the water? If you lived on this side, my friend, I should be an assassin, and it would be unjust to slay you in this manner But since you live on the other side, I am a hero, and it is just "

294 On what shall man found the order of the world which he would govern? Shall it be on the caprice of each individual? What confusion! Shall it be on justice? Man is ignorant of it

Certainly, had he known it, he would not have established this maxim, the most general of all that obtain among men, that each should follow the custom of his own country The glory of true equity would have brought all nations under subjection, and legislators would not have taken as their model the fancies and caprice of Persians and Germans instead of this unchanging justice We would have seen it set up in all the States on earth and in all times, whereas we see neither justice nor injustice which does not change its nature with change in climate Three degrees of latitude reverse all jurisprudence, a meridian decides the truth Fundamental laws change after a few years of possession, right has its epochs, the entry of Saturn into the Lion marks to us the origin of such and such a crime A strange justice that is bounded by a river! Truth on this side of the Pyrenees, error on the other side

Men admit that justice does not consist in these customs, but that it resides in natural laws, common to every country They would certainly maintain it obstinately, if reckless chance which has distributed human laws had encountered even one which was universal, but the farce is that the caprice of men has so many vagaries that there is no such law

Theft incest infanticide parricide, have all had a place among virtuous actions Can anything be more ridiculous than that a man should have the right to kill me because he lives on the other side of the water and because his ruler has a quarrel with mine though I have none with him?

Doubtless there are natural laws but good reason once corrupted has corrupted all *Nihil amplius nostrum est quod nostrum dicimus artis est* [1] *Ex senatus—consultis et plebiscitis crimina exercentur* [2] *Ut olim vitiis sic nunc legibus laboramus* [3]

The result of this confusion is that one affirms the essence of justice to be the authority of the legislator another the interest of the sovereign another present custom and this is the most sure Nothing according to reason alone, is just in i self all changes with time Custom creates the whole of equity for the simple reason that it is accepted It is the mystical foundation of its authority whoever carries it back to first principles destroys it Nothing is so faulty as those laws which correct faults He who obeys them because they are just obeys a justice which is imaginary and not the essence of law it is quite self contained it is law and nothing more He who will examine its motive will find it so feeble and so trifling that if he be not accustomed to contemplate the wonders of human imag ination he will marvel that one century has gained for it so much pomp and reverence The art of opposition and of revolution is to unsettle established cus toms sounding them even to their source to point out their want of authority and justice We must it is said get back to the natural and fundamental laws of the State which an unjust custom has abolished It is a game certain to result in the loss of all nothing will be just on the balance Yet people readily lend their ear to such arguments They shake off the yoke as soon as they recognise it and the great profit by their ruin and by that of these curious investigators of ac cepted customs But from a contrary mistake men sometimes think they can justly do everything which is not without an example That is why the wisest of legislators said that it was necessary to deceive men for their own good and another a good politician *Cum veritatem qua liberetur ignoret expedit quod fallatur* [4] We must not see the fact of usurpation law was once introduced with out reason and has become reasonable We must make it regarded as authori tative eternal and conceal its origin if we do not wish that it should soon come to an end

295 *Mine thine*— This dog is mine said those poor children that is my place in the sun Here is the beginning and the image of the usurpation of all the earth

.96 When the question for consideration is whether we ought to make war and kill so many men—condemn so many Spaniards to death—only one man is judge and he is an interested party There should be a third who is disinterested

[1]Cicero *De finibus* v 21 There is no longer anything which is ours what I call ours is conventional

[2]Seneca *Epistles* xcv It is by virtue of *senatus-consultes* and plebiscites that one commits crimes

[3]Tacitus *Annals* iii.25 Once we suffered from our vices today we suffer from our laws"

[4]Saint Augustine *City of God* iv 27 As he has ignored the truth which frees it is right he is mistaken

297 *Veri juris*[1]—We have it no more, if we had it, we should take conformity to the customs of a country as the rule of justice It is here that, not finding justice, we have found force, etc

298 *Justice, might* —It is right that what is just should be obeyed, it is necessary that what is strongest should be obeyed Justice without might is helpless, might without justice is tyrannical Justice without might is gainsaid, because there are always offenders, might without justice is condemned We must then combine justice and might and, for this end, make what is just strong, or what is strong just

Justice is subject to dispute, might is easily recognised and is not disputed So we cannot give might to justice, because might has gainsaid justice and has declared that it is she herself who is just And thus, being unable to make what is just strong, we have made what is strong just

299 The only universal rules are the laws of the country in ordinary affairs and of the majority in others Whence comes this? From the might which is in them Hence it comes that kings, who have power of a different kind, do not follow the majority of their ministers

No doubt equality of goods is just, but, being unable to cause might to obey justice, men have made it just to obey might Unable to strengthen justice, they have justified might, so that the just and the strong should unite, and there should be peace, which is the sovereign good

300 "When a strong man armed keepeth his goods, his goods are in peace "

301 Why do we follow the majority? Is it because they have more reason? No, because they have more power

Why do we follow the ancient laws and opinions? Is it because they are more sound? No, but because they are unique and remove from us the root of difference

302 It is the effect of might, not of custom For those who are capable of originality are few, the greater number will only follow and refuse glory to those inventors who seek it by their inventions And if these are obstinate in their wish to obtain glory and despise those who do not invent, the latter will call them ridiculous names and will beat them with a stick Let no one, then, boast of his subtlety, or let him keep his complacency to himself

303 Might is the sovereign of the world, and not opinion But opinion makes use of might It is might that makes opinion Gentleness is beautiful in our opinion Why? Because he who will dance on a rope will be alone, and I will gather a stronger mob of people who will say that it is unbecoming

304 The cords which bind the respect of men to each other are in general cords of necessity, for there must be different degrees, all men wishing to rule, and not all being able to do so, but some being able

Let us, then, imagine we see society in the process of formation Men will

[1]Cicero, *De officiis*, iii, 17 Concerning true law

doubtless fight till the stronger party overcomes the weaker and a dominant party is established But when this is once determined the masters who do not desire the continuation of strife then decree that the power which is in their hands shall be transmitted as they please Some place it in election by the people others in hereditary succession etc

And this is the point where imagination begins to play its part Till now power makes fact now power is sustained by imagination in a certain party in France in the nobility in Switzerland in the burgesses etc

These cords which bind the respect of men to such and such an individual are therefore the cords of imagination

305 The Swiss are offended by being called *gentlemen* and prove themselves true plebeians in order to be thought worthy of great office

306 As duchies kingships and magistracies are real and necessary, because might rules all they exist everywhere and always But since only caprice makes such and such a one a ruler the principle is not constant but subject to variation etc

307 The chancellor is grave and clothed with ornaments for his position is unreal Not so the king he has power and has nothing to do with the imagination Judges physicians etc appeal only to the imagination

308 The habit of seeing kings accompanied by guards drums officers and all the paraphernalia which mechanically inspire respect and awe makes their countenance when sometimes seen alone without these accompaniments impress respect and awe on their subjects because we cannot separate in thought their persons from the surroundings with which we see them usually joined And the world which knows not that this effect is the result of habit believes that it arises by a natural force whence come these words The character of Divinity is stamped on his countenance etc

309 *Justice* —As custom determines what is agreeable so also does it determine justice

310 *King and tyrant* —I too will keep my thoughts secret

I will take care on every journey

Greatness of establishment respect for establishment

The pleasure of the great is the power to make people happy

The property of riches is to be given liberally

The property of each thing must be sought The property of power is to protect

When force attacks humbug when a private soldier takes the square cap off a first president and throws it out of the window

311 The government founded on opinion and imagination reigns for some time and this government is pleasant and voluntary that founded on might lasts for ever Thus opinion is the queen of the world but might is its tyrant

312 Justice is what is established, and thus all our established laws will necessarily be regarded as just without examination, since they are established

313 *Sound opinions of the people* —Civil wars are the greatest of evils They are inevitable, if we wish to reward desert, for all will say they are deserving The evil we have to fear from a fool who succeeds by right of birth, is neither so great nor so sure

314 God has created all for Himself He has bestowed upon Himself the power of pain and pleasure

You can apply it to God, or to yourself If to God, the Gospel is the rule If to yourself, you will take the place of God As God is surrounded by persons full of charity, who ask of Him the blessings of charity that are in His power, so recognise, then, and learn that you are only a king of lust, and take the ways of lust

315 *The reason of effects* —It is wonderful that men would not have me honour a man clothed in brocade and followed by seven or eight lackeys! Why! He will have me thrashed, if I do not salute him This custom is a farce It is the same with a horse in fine trappings in comparison with another! Montaigne is a fool not to see what difference there is, to wonder at our finding any, and to ask the reason Indeed, says he, "how comes it," etc

316 *Sound opinions of the people* —To be spruce is not altogether foolish, for it proves that a great number of people work for one It shows by one s hair, that one has a valet, a perfumer, etc , by one s band, thread, lace, etc Now it is not merely superficial nor merely outward show to have many arms at command The more arms one has, the more powerful one is To be spruce is to show one's power

317 Deference means, Put yourself to inconvenience This is apparently silly, but is quite right For it is to say, 'I would indeed put myself to inconvenience if you required it, since indeed I do so when it is of no service to you " Deference further serves to distinguish the great Now if deference was displayed by sitting in an arm chair, we should show deference to everybody, and so no distinction would be made, but, being put to inconvenience, we distinguish very well

318 He has four lackeys

319 How rightly do we distinguish men by external appearances rather than by internal qualities! Which of us two shall have precedence? Who will give place to the other? The least clever But I am as clever as he We should have to fight over this He has four lackeys, and I have only one This can be seen, we have only to count It falls to me to yield, and I am a fool if I contest the matter By this means we are at peace, which is the greatest of boons

320 The most unreasonable things in the world become most reasonable, because of the unruliness of men What is less reasonable than to choose the eldest son of a queen to rule a State? We do not choose as captain of a ship the passenger who is of the best family

This law would be absurd and unjust but because men are so themselves and always will be so it becomes reasonable and just For whom will men choose as the most virtuous and able? We at once come to blows as each claims to be the most virtuous and able Let us then attach this quality to something indisputable This is the king s eldest son That is clear and there is no dispute Reason can do no better for civil war is the greatest of evils

321 Children are astonished to see their comrades respected

322 To be of noble birth is a great advantage In eighteen years it places a man within the select circle known and respected as another would have merited in fifty years It is a gain of thirty years without trouble

323 What is the Ego?

Suppose a man puts himself at a window to see those who pass by If I pass by can I say that he placed himself there to see me? No for he does not think of me in particular But does he who loves someone on account of beauty really love that person? No for the small pox which will kill beauty without killing the person will cause him to love her no more

And if one loves me for my judgement memory he does not love *me* for I can lose these qualities without losing myself Where then is this Ego if it be neither in the body nor in the soul? And how love the body or the soul except for these qualities which do not constitute *me* since they are perishable? For it is impossible and would be unjust to love the soul of a person in the abstract and whatever qualities might be therein We never then love a person but only qualities

Let us then jeer no more at those who are honoured on account of rank and office for we love a person only on account of borrowed qualities

324 The people have very sound opinions for example

1 In having preferred diversion and hunting to poetry The half learned laugh at it and glory in being above the folly of the world but the people are right for a reason which these do not fathom

2 In having distinguished men by external marks as birth or wealth The world again exults in showing how unreasonable this is but it is very reasonable Savages laugh at an infant king

3 In being offended at a blow or in desiring glory so much But it is very desirable on account of the other essential goods which are joined to it and a man who has received a blow without resenting it is overwhelmed with taunts and indignities

4 *In working for the uncertain in sailing on the sea in walking over a plank*

325 Montaigne is wrong Custom should be followed only because it is custom and not because it is reasonable or just But people follow it for this sole reason that they think it just Otherwise they would follow it no longer although it were the custom for they will only submit to reason or justice Custom without this would pass for tyranny but the sovereignty of reason and justice is no more tyrannical than that of desire They are principles natural to man

It would, therefore, be right to obey laws and customs, because they are laws, but we should know that there is neither truth nor justice to introduce into them, that we know nothing of these, and so must follow what is accepted By this means we would never depart from them But people cannot accept this doctrine, and, as they believe that truth can be found, and that it exists in law and custom, they believe them and take their antiquity as a proof of their truth, and not simply of their authority apart from truth Thus they obey laws, but they are liable to revolt when these are proved to be valueless, and this can be shown of all, looked at from a certain aspect

326 *Injustice* —It is dangerous to tell the people that the laws are unjust, for they obey them only because they think them just Therefore it is necessary to tell them at the same time that they must obey them because they are laws, just as they must obey superiors, not because they are just, but because they are superiors In this way all sedition is prevented, if this can be made intelligible and it be under stood what is the proper definition of justice

327 The world is a good judge of things, for it is in natural ignorance, which is man s true state The sciences have two extremes which meet The first is the pure natural ignorance in which all men find themselves at birth The other extreme is that reached by great intellects, who, having run through all that men can know, find they know nothing, and come back again to that same ignorance from which they set out, but this is a learned ignorance which is conscious of itself Those between the two, who have departed from natural ignorance and not been able to reach the other, have some smattering of this vain knowledge and pretend to be wise These trouble the world and are bad judges of everything The people and the wise constitute the world, these despise it, and are despised They judge badly of everything, and the world judges rightly of them

328 *The reason of effects* —Continual alternation of pro and con

We have, then, shown that man is foolish, by the estimation he makes of things which are not essential, and all these opinions are destroyed We have next shown that all these opinions are very sound and that thus, since all these vanities are well founded, the people are not so foolish as is said And so we have destroyed the opinion which destroyed that of the people

But we must now destroy this last proposition and show that it remains always true that the people are foolish, though their opinions are sound because they do not perceive the truth where it is, and, as they place it where it is not, their opinions are always very false and very unsound

329 *The reason of effects* —The weakness of man is the reason why so many things are considered fine, as to be good at playing the lute It is *only an evil* because of our weakness

330 The power of kings is founded on the reason and on the folly of the people, and specially on their folly The greatest and most important thing in the world has weakness for its foundation, and this foundation is wonderfully sure, for there is *nothing more sure* than this, that the people will be

weak What is based on sound reason is very ill founded as the estimate of wisdom

331 We can only think of Plato and Aristotle in grand academic robes They were honest men like others laughing with their friends and when they diverted themselves with writing their *Laws* and the *Politics* they did it as an amusement That part of their life was the least philosophic and the least serious, the most philo sophic was to live simply and quietly If they wrote on politics it was as if laying down rules for a lunatic asylum and if they presented the appearance of speaking of a great matter it was because they knew that the madmen to whom they spoke thought they were kings and emperors They entered into their principles in order to make their madness as little harmful as possible

332 Tyranny consists in the desire of universal power beyond its scope

There are different assemblies of the strong the fair the sensible the pious in which each man rules at home not elsewhere And sometimes they meet and the strong and the fair foolishly fight as to who shall be master for their mastery is of different kinds They do not understand one another and their fault is the de sire to rule everywhere Nothing can effect this not even might which is of no use in the kingdom of the wise and is only mistress of external actions

Tyranny— So these expressions are false and tyrannical I am fair there fore I must be feared I am strong therefore I must be loved I am

Tyranny is the wish to have in one way what can only be had in another We render different duties to different merits the duty of love to the pleasant the duty of fear to the strong duty of belief to the learned

We must render these duties it is unjust to refuse them and unjust to ask others And so it is false and tyrannical to say He is not strong therefore I will not esteem him he is not able therefore I will not fear him

333 Have you never seen people who in order to complain of the little fuss you make about them parade before you the example of great men who esteem them? In answer I reply to them Show me the merit whereby you have charmed these persons and I also will esteem you

334 *The reason of effects* —Lust and force are the source of all our actions lust causes voluntary actions force involuntary ones

335 *The reason of effects* —It is then true to say that all the world is under a de lusion for although the opinions of the people are sound they are not so as con ceived by them since they think the truth to be where it is not Truth is indeed in their opinions but not at the point where they imagine it [Thus] it is true that we must honour noblemen but not because noble birth is real superiority etc

336 *The reason of effects* —We must keep our thought secret and judge every thing by it while talking like the people

337 *The reason of effects* Degrees The people honour persons of high birth The semi learned despise them saying that birth is not a personal but a chance supe riority The learned honour them not for popular reasons but for secret reasons

Devout persons, who have more zeal than knowledge, despise them, in spite of that consideration which makes them honoured by the learned, because they judge them by a new light which piety gives them But perfect Christians honour them by another and higher light So arise a succession of opinions for and against, according to the light one has

338 True Christians, nevertheless, comply with folly, not because they respect folly, but the command of God, who for the punishment of men has made them subject to these follies *Omnis creatura subjecta est vanitati* [1] *Liberabitur* [2] Thus Saint Thomas explains the passage in Saint James on giving place to the rich, that, if they do it not in the sight of God, they depart from the command of religion

SECTION VI

THE PHILOSOPHERS

339 I can well conceive a man without hands, feet, head (for it is only experience which teaches us that the head is more necessary than feet) But I cannot conceive man without thought, he would be a stone or a brute

340 The arithmetical machine produces effects which approach nearer to thought than all the actions of animals But it does nothing which would enable us to attribute will to it, as to the animals

341 The account of the pike and frog of Liancourt They do it always, and never otherwise, nor any other thing showing mind

342 If an animal did by mind what it does by instinct, and if it spoke by mind what it speaks by instinct, in hunting and in warning its mates that the prey is found or lost, it would indeed also speak in regard to those things which affect it closer, as example, Gnaw me this cord which is wounding me, and which I cannot reach "

343 The beak of the parrot, which it wipes, although it is clean

344 Instinct and reason, marks of two natures

345 Reason commands us far more imperiously than a master, for in disobeying the one we are unfortunate, and in disobeying the other we are fools

346 Thought constitutes the greatness of man

347 Man is but a reed, the most feeble thing in nature, but he is a thinking reed The entire universe need not arm itself to crush him A vapour, a drop of

[1] *Eccles 3 19 for all is vanity*
[2] Rom 8 20-21 It shall be delivered.

water suffices to kill him But if the universe were to crush him man would still be more noble than that which killed him because he knows that he dies and the advantage which the universe has over him the universe knows nothing of this

All our dignity consists then in thought By it we must elevate ourselves and not by space and time which we cannot fill Let us endeavour then to think well this is the principle of morality

348 *A thinking reed*—It is not from space that I must seek my dignity but from the government of my thought I shall have no more if I possess worlds By space the universe encompasses and swallows me up like an atom by thought I comprehend the world

349 *Immateriality of the soul*—Philosophers who have mastered their passions What matter could do that?

350 *The Stoics*—They conclude that what has been done once can be done always and that since the desire of glory imparts some power to those whom it possesses others can do likewise There are feverish movements which health cannot imitate

Epictetus concludes that since there are consistent Christians every man can easily be so

351 Those great spiritual efforts which the soul sometimes assays are things on which it does not lay hold It only leaps to them not as upon a throne for ever but merely for an instant

352 The strength of a man s virtue must not be measured by his efforts but by his ordinary life

353 I do not admire the excess of a virtue as of valour except I see at the same time the excess of the opposite virtue as in Epaminondas who had the greatest valour and the greatest kindness For otherwise it is not to rise it is to fall We do not display greatness by going to one extreme but in touching both at once and filling all the intervening space But perhaps this is only a sudden movement of the soul from one to the other extreme and in fact it is ever at one point only as in the case of a firebrand Be it so but at least this indicates agility if not expanse of soul

354 Man s nature is not always to advance it has its advances and retreats

Fever has its cold and hot fits and the cold proves as well as the hot the greatness of the fire of fever

The discoveries of men from age to age turn out the same The kindness and the malice of the world in general are the same *Plerumque gratæ principibus vices*[1]

355 Continuous eloquence wearies

Princes and kings sometimes play They are not always on their thrones They weary there Grandeur must be abandoned to be appreciated Continuity in every thing is unpleasant Cold is agreeable that we may get warm

[1]Horace *Od* I II xxix 13 Changes nearly always please the great

Nature acts by progress, *itus et reditus* It goes and returns, then advances further, then twice as much backwards, then more forward than ever, etc

The tide of the sea behaves in the same manner, and so, apparently, does the sun in its course

356 The nourishment of the body is little by little Fullness of nourishment and smallness of substance

357 When we would pursue virtues to their extremes on either side, vices present themselves, which insinuate themselves insensibly there, in their insensible journey towards the infinitely little, and vices present themselves in a crowd towards the infinitely great, so that we lose ourselves in them and no longer see virtues We find fault with perfection itself

358 Man is neither angel nor brute, and the unfortunate thing is that he who would act the angel acts the brute

359 We do not sustain ourselves in virtue by our own strength, but by the balancing of two opposed vices, just as we remain upright amidst two contrary gales Remove one of the vices, and we fall into the other

360 What the Stoics propose is so difficult and foolish!

The Stoics lay down that all those who are not at the high degree of wisdom are equally foolish and vicious, as those who are two inches under water

361 *The sovereign good Dispute about the sovereign good —Ut sis contentus temetipso et ex te nascentibus bonis* [1] There is a contradiction, for in the end they advise suicide Oh! What a happy life, from which we are to free ourselves as from the plague!

362 *Ex senatus consultis et plebiscitis*

To ask like passages

363 *Ex senatus consultis et plebiscitis scelera exercentur* Seneca [2] 588 [3]

Nihil tam absurde dici potest quod non dicatur ab aliquo philosophorum [4]

Quibusdam destinatis sententiis consecrati quæ non probant coguntur defendere [5]

Ut omnium rerum sic litterarum quoque intemperantia laboramus [6]

Id maxime quemque decet, quod est cujusque suum maxime [7]

Hos natura modos primum dedit [8]

[1]Seneca, *Epistles*, xx 8 In order that you are satisfied with yourself and the good that is born from you

[2]See P 226 Note [2]

[3]Montaigne, *Essays* ii 12

[4]Cicero *De Divinatione*, ii 58 There is nothing so absurd that it has not been said by some philosopher

[5]Cicero *Disputationes Tusculanae* ii 2 Devoted to certain fixed opinions they are forced to defend what they hardly approve

[6]Seneca *Epistles*, cvi We suffer from an excess of literature as from an excess of anything

[7]Cicero *De officiis* i 31 What suits each one best is what is to him the most natural

[8]Virgil, *The Georgics*, ii 20 Nature gave them first these limits

Paucis opus est litteris ad bonam mentem [1]
Si quando turpe non sit tamen non est non turpe quum id a multitudine laudetur [2]
Mihi sic usus est tibi ut opus est facto fac [3]

364 *Rarum est enim ut satis se quisque vereatur* [4]
Tot circa unum caput tumultuantes deos [5]
Nihil turpius quam cognitioni assertionem præcurrere [6]
Nec me pudet ut istos fateri nescire quid nesciam [7]
Melius non incipient [8]

365 *Thought* —All the dignity of man consists in thought Thought is therefore by its nature a wonderful and incomparable thing It must have strange defects to be contemptible But it has such so that nothing is more ridiculous How great it is in its nature! How vile it is in its defects!

But what is this thought? How foolish it is!

366 The mind of this sovereign judge of the world is not so independent that it is not liable to be disturbed by the first din about it The noise of a cannon is not necessary to hinder its thoughts it needs only the creaking of a weathercock or a pulley Do not wonder if at present it does not reason well a fly is buzzing in its ears that is enough to render it incapable of good judgement If you wish it to be able to reach the truth chase away that animal which holds its reason in check and disturbs that powerful intellect which rules towns and kingdoms Here is a comical god! *O ridicolosissimo eroe!*

367 The power of flies they win battles hinder our soul from acting eat our body

368 When it is said that heat is only the motions of certain molecules and light the *conatus recedendi* which we feel it astonishes us What! Is pleasure only the ballet of our spirits? We have conceived so different an idea of it! And these sensations seem so removed from those others which we say are the same as those with which we compare them! The sensation from the fire that warmth which affects us in a manner wholly different from touch the reception of sound and light all this appears to us mysterious and yet it is material like the blow of a stone It is true that the smallness of the spirits which enter into the pores touches other nerves but there are always some nerves touched

369 Memory is necessary for all the operations of reason

[1]Seneca *Epistles* cvi Wisdom does not demand much teaching
[2]Cicero *De finibus bonorum et malorum* What is not shameful begins to become so when it is approved by the multitude
[3]Terence *Heauton Timorumenos* I i.21 That is how I use it you must do as you wish
[4]Quintillian, x 7 It is rare that one sufficiently respects one s self
[5]Seneca the Elder *Suasoriae* i 4 So many gods are busy around a single head
[6]Cicero *Academica* i 45 Nothing is more shameful than to affirm before knowing
[7]Cicero *Disputationes Tusculanae* i.25 I have not shame as they do to admit that I know not what I do not know
[8]Seneca *Epistles* lxxii It is easier not to begin

370 [Chance gives rise to thoughts, and chance removes them, no art can keep or acquire them

A thought has escaped me I wanted to write it down I write instead that it has escaped me]

371 [When I was small, I hugged my book, and because it sometimes happened to me to in believing I hugged it, I doubted]

372 In writing down my thought, it sometimes escapes me, but this makes me remember my weakness, that I constantly forget This is as instructive to me as my forgotten thought, for I strive only to know my nothingness

373 *Scepticism* —I shall here write my thoughts without order, and not perhaps in unintentional confusion, that is true order, which will always indicate my object by its very disorder I should do too much honour to my subject, if I treated it with order, since I want to show that it is incapable of it

374 What astonishes me most is to see that all the world is not astonished at its own weakness Men act seriously, and each follows his own mode of life, not because it is in fact good to follow since it is the custom, but as if each man knew certainly where reason and justice are They find themselves continually deceived, and, by a comical humility, think it is their own fault and not that of the art which they claim always to possess But it is well there are so many such people in the world, who are not sceptics for the glory of scepticism, in order to show that man is quite capable of the most extravagant opinions, since he is capable of believing that he is not in a state of natural and inevitable weakness, but, on the contrary, of natural wisdom

Nothing fortifies scepticism more than that there are some who are not sceptics, if all were so, they would be wrong

375 [I have passed a great part of my life believing that there was justice, and in this I was not mistaken, for there is justice according as God has willed to reveal it to us But I did not take it so, and this is where I made a mistake, for I believed that our justice was essentially just, and that I had that whereby to know and judge of it But I have so often found my right judgement at fault, that at last I have come to distrust myself and then others I have seen changes in all nations and men, and thus, after many changes of judgement regarding true justice, I have recognised that our nature was but in continual change, and I have not changed since, and if I changed, I would confirm my opinion

The sceptic Arcesilaus, who became a dogmatist]

376 This sect derives more strength from its enemies than from its friends, for the weakness of man is far more evident in those who know it not than in those who know it

377 Discourses on humility are a source of pride in the vain and of humility in the humble So those on scepticism cause believers to affirm Few men speak humbly of humility, chastely of chastity, few doubtingly of scepticism We are only

falsehood duplicity contradiction we both conceal and disguise ourselves from ourselves

378 *Scepticism* —Excess like defect of intellect is accused of madness Nothing is good but mediocrity The majority has settled that and finds fault with him who escapes it at whichever end I will not oppose it I quite consent to put myself there and refuse to be at the lower end not because it is low but because it is an end for I would likewise refuse to be placed at the top To leave the mean is to abandon humanity The greatness of the human soul consists in knowing how to preserve the mean So far from greatness consisting in leaving it it consists in not leaving it

379 It is not good to have too much liberty It is not good to have all one wants

380 All good maxims are in the world We only need to apply them For instance we do not doubt that we ought to risk our lives in defence of the public good but for religion no

It is true there must be inequality among men but if this be conceded the door is opened not only to the highest power but to the highest tyranny

We must relax our minds a little but this opens the door to the greatest debauchery Let us mark the limits There are no limits in things Laws would put them there and the mind cannot suffer it

381 When we are too young we do not judge well so also when we are too old If we do not think enough or if we think too much on any matter we get obstinate and infatuated with it If one considers one s work immediately after having done it one is entirely prepossessed in its favour by delaying too long one can no longer enter into the spirit of it So with pictures seen from too far or too near there is but one exact point which is the true place wherefrom to look at them the rest are too near too far too high or too low Perspective determines that point in the art of painting But who shall determine it in truth and morality?

38 When all is equally agitated nothing appears to be agitated as in a ship When all tend to debauchery none appears to do so He who stops draws attention to the excess of others like a fixed point

383 The licentious tell men of orderly lives that they stray from nature s path while they themselves follow it as people in a ship think those move who are on the shore On all sides the language is similar We must have a fixed point in order to judge The harbour decides for those who are in a ship but where shall we find a harbour in morality?

384 Contradiction is a bad sign of truth several things which are certain are contradicted several things which are false pass without contradiction Contradiction is not a sign of falsity nor the want of contradiction a sign of truth

385 *Scepticism* —Each thing here is partly true and partly false Essential truth is

not so, it is altogether pure and altogether true This mixture dishonours and annihilates it Nothing is purely true, and thus nothing is true, meaning by that pure truth You will say it is true that homicide is wrong Yes, for we know well the wrong and the false But what will you say is good? Chastity? I say no, for the world would come to an end Marriage? No, continence is better Not to kill? No, for lawlessness would be horrible, and the wicked would kill all the good To kill? No, for that destroys nature We possess truth and goodness only in part, and mingled with falsehood and evil

386 If we dreamt the same thing every night, it would affect us as much as the objects we see every day And if an artisan were sure to dream every night for twelve hours' duration that he was a king, I believe he would be almost as happy as a king, who should dream every night for twelve hours on end that he was an artisan

If we were to dream every night that we were pursued by enemies and harassed by these painful phantoms, or that we passed every day in different occupations, as in making a voyage, we should suffer almost as much as if it were real, and should fear to sleep, as we fear to wake when we dread in fact to enter on such mishaps And, indeed, it would cause pretty nearly the same discomforts as the reality

But since dreams are all different, and each single one is diversified, what is seen in them affects us much less than what we see when awake, because of its continuity, which is not, however, so continuous and level as not to change too, but it changes less abruptly, except rarely, as when we travel, and then we say, It seems to me I am dreaming For life is a dream a little less inconstant

387 [It may be that there are true demonstrations, but this is not certain Thus, this proves nothing else but that it is not certain that all is uncertain, to the glory of scepticism]

388 *Good sense* —They are compelled to say, "You are not acting in good faith, we are not asleep, etc How I love to see this proud reason humiliated and suppliant! For this is not the language of a man whose right is disputed, and who defends it with the power of armed hands He is not foolish enough to declare that men are not acting in good faith, but he punishes this bad faith with force

389 Ecclesiastes shows that man without God is in total ignorance and inevitable misery For it is wretched to have the wish, but not the power Now he would be happy and assured of some truth, and yet he can neither know, nor desire not to know He cannot even doubt

390 My God! How foolish this talk is! Would God have made the world to damn it? Would He ask so much from persons so weak ? etc Scepticism is the cure for this evil, and will take down this vanity

391 *Conversation* —Great words Religion, I deny it
Conversation —Scepticism helps religion

392 *Against Scepticism* —[It is, then, a strange fact that we cannot define

these things without obscuring them while we speak of them with all assurance] We assume that all conceive of them in the same way but we assume it quite gratuitously for we have no proof of it I see in truth that the same words are applied on the same occasions and that every time two men see a body change its place they both express their view of this same fact by the same word both saying that it has moved and from this conformity of application we derive a strong conviction of a conformity of ideas But this is not absolutely or finally convincing though there is enough to support a bet on the affirmative since we know that we often draw the same conclusions from different premises

This is enough at least to obscure the matter not that it completely extinguishes the natural light which assures us of these things The academicians would have won But this dulls it and troubles the dogmatists to the glory of the sceptical crowd which consists in this doubtful ambiguity and in a certain doubtful dimness from which our doubts cannot take away all the clearness nor our own natural lights chase away all the darkness

393 It is a singular thing to consider that there are people in the world who having renounced all the laws of God and nature have made laws for themselves which they strictly obey as for instance the soldiers of Mahomet robbers heretics etc It is the same with logicians It seems that their license must be without any limits or barriers since they have broken through so many that are so just and sacred

394 All the principles of sceptics stoics atheists etc are true But their conclusions are false because the opposite principles are also true

395 *Instinct reason* —We have an incapacity of proof insurmountable by all dogmatism We have an idea of truth invincible to all scepticism

396 Two things instruct man about his whole nature instinct and experience

397 The greatness of man is great in that he knows himself to be miserable A tree does not know itself to be miserable It is then being miserable to know oneself to be miserable but it is also being great to know that one is miserable

398 All these same miseries prove man s greatness They are the miseries of a great lord of a deposed king

399 We are not miserable without feeling it A ruined house is not miserable Man only is miserable *Ego vir videns* [1]

400 *The greatness of man* —We have so great an idea of the soul of man that we cannot endure being despised or not being esteemed by any soul and all the happiness of men consists in this esteem

401 *Glory* —The brutes do not admire each other A horse does not admire his companion Not that there is no rivalry between them in a race but that is of no

[1] Lam 3 1 I am the man that hath seen

consequence, for, when in the stable, the heaviest and most ill formed does not give up his oats to another, as men would have others do to them Their virtue is satisfied with itself

402 The greatness of man even in his lust, to have known how to extract from it a wonderful code, and to have drawn from it a picture of benevolence

403 *Greatness* —The reasons of effects indicate the greatness of man, in having extracted so fair an order from lust

404 The greatest baseness of man is the pursuit of glory But is is also the greatest mark of his excellence, for whatever possessions he may have on earth, whatever health and essential comfort, he is not satisfied if he has not the esteem of men He values human reason so highly that, whatever advantages he may have on earth, he is not content if he is not also ranked highly in the judgement of man This is the finest position in the world Nothing can turn him from that desire, which is the most indelible quality of man s heart

And those who must despise men, and put them on a level with the brutes, yet wish to be admired and believed by men, and contradict themselves by their own feelings, their nature, which is stronger than all, convincing them of the greatness of man more forcibly than reason convinces them of their baseness

405 *Contradiction* —Pride counterbalancing all miseries Man either hides his miseries, or, if he disclose them, glories in knowing them

406 Pride counterbalances and takes away all miseries Here is a strange monster and a very plain aberration He is fallen from his place and is anxiously seeking it This is what all men do Let us see who will have found it

407 When malice has reason on its side, it becomes proud and parades reason in all its splendour When austerity or stern choice has not arrived at the true good and must needs return to follow nature, it becomes proud by reason of this return

408 Evil is easy, and has infinite forms, good is almost unique But a certain kind of evil is as difficult to find as what we call good, and often on this account such particular evil gets passed off as good An extraordinary greatness of soul is needed in order to attain to it as well as to good

409 *The greatness of man* —The greatness of man is so evident that it is even proved by his wretchedness For what in animals is *nature*, we call in man *wretchedness*, by which we recognise that, his nature being now like that of animals, he has fallen from a better nature which once was his

For who is unhappy at not being a king, except a deposed king? Was Paulus Æmilius unhappy at being no longer consul? On the contrary, everybody thought him happy in having been consul, because the office could only be held for a time But men thought Perseus so unhappy in being no longer king, because the condition of kingship implied his being always king, that they thought it strange that he endured life Who is unhappy at only having one mouth? And who is not un

happy at having only one eye? Probably no man ever ventured to mourn at not having three eyes But any one is inconsolable at having none

410 *Perseus King of Macedon*—Paulus Æmilius reproached Perseus for not killing himself

411 Notwithstanding the sight of all our miseries which press upon us and take us by the throat we have an instinct which we cannot repress and which lifts us up

412 There is internal war in man between reason and the passions
If he had only reason without passions
If he had only passions without reason
But having both he cannot be without strife being unable to be at peace with the one without being at war with the other Thus he is always divided against and opposed to himself

413 This internal war of reason against the passions has made a division of those who would have peace into two sects The first would renounce their passions and become gods the others would renounce reason and become brute beasts (Des Barreaux) But neither can do so and reason still remains to condemn the vileness and injustice of the passions and to trouble the repose of those who abandon themselves to them and the passions keep always alive in those who would renounce them

414 Men are so necessarily mad that not to be mad would amount to another form of madness

415 The nature of man may be viewed in two ways the one according to its end and then he is great and incomparable the other according to the multitude just as we *judge of the nature of the horse and the dog popularly by seeing its fleetness* *et animum arcendi* and then man is abject and vile These are the two ways which make us judge of him differently and which occasion such disputes among philosophers For one denies the assumption of the other One says He is not born for this end for all his actions are repugnant to it The other says He forsakes his end when he does these base actions

416 *For Port Royal Greatness and wretchedness*—Wretchedness being deduced from greatness and greatness from wretchedness some have inferred man s wretchedness all the more because they have taken his greatness as a proof of it and others have inferred his greatness with all the more force because they have inferred it from his very wretchedness All that the one party has been able to say in proof of his greatness has only served as an argument of his wretchedness to the others because the greater our fall the more wretched we are and *vice versa* The one party is brought back to the other in an endless circle it being certain that in *proportion as men possess light they discover both the greatness and the* wretchedness of man In a word man knows that he is wretched He is therefore wretched because he is so but he is really great because he knows it

417 This twofold nature of man is so evident that some have thought that we had two souls A single subject seemed to them incapable of such sudden variations from unmeasured presumption to a dreadful dejection of heart

418 It is dangerous to make man see too clearly his equality with the brutes without showing him his greatness It is also dangerous to make his see his greatness too clearly, apart from his vileness It is still more dangerous to leave him in ignorance of both But it is very advantageous to show him both Man must not think that he is on a level either with the brutes or with the angels, nor must he be ignorant of both sides of his nature, but he must know both

419 I will not allow man to depend upon himself, or upon another, to the end that, being without a resting-place and without repose

420 If he exalt himself, I humble him, if he humble himself, I exalt him, and I always contradict him, till he understands that he is an incomprehensible monster

421 I blame equally those who choose to praise man, those who choose to blame him, and those who choose to amuse themselves, and I can only approve of those who seek with lamentation

422 It is good to be tired and wearied by the vain search after the true good, that we may stretch out our arms to the Redeemer

423 *Contraries After having shown the vileness and the greatness of man* —Let man now know his value Let him love himself, for there is in him a nature capable of good, but let him not for this reason love the vileness which is in him Let him despise himself, for this capacity is barren, but let him not therefore despise this natural capacity Let him hate himself, let him love himself, he has within him the capacity of knowing the truth and of being happy, but he possesses no truth, either constant or satisfactory

I would then lead man to the desire of finding truth, to be free from passions, and ready to follow it where he may find it, knowing how much his knowledge is obscured by the passions I would, indeed, that he should hate in himself the lust which determined his will by itself so that it may not blind him in making his choice, and may not hinder him when he has chosen

424 All these contradictions, which seem most to keep me from the knowledge of religion, have led me most quickly to the true one

SECTION VII

MORALITY AND DOCTRINE

425 *Second part —That man without faith cannot know the true good, nor justice*

All men seek happiness This is without exception Whatever different means

they employ they all tend to this end The cause of some going to war and of others avoiding it is the same desire in both attended with different views The will never takes the least step but to this object This is the motive of every action of every man even of those who hang themselves

And yet after such a great number of years no one without faith has reached the point to which all continually look All complain princes and subjects noble men and commoners old and young strong and weak learned and ignorant healthy and sick of all countries all times all ages and all conditions

A trial so long so continuous and so uniform should certainly convince us of our inability to reach the good by our own efforts But example teaches us little No resemblance is ever so perfect that there is not some slight difference and hence we expect that our hope will not be deceived on this occasion as before And thus while the present never satisfies us experience dupes us and from misfortune to misfortune leads us to death their eternal crown

What is it then that this desire and this inability proclaim to us but that there was once in man a true happiness of which there now remain to him only the mark and empty trace which he in vain tries to fill from all his surroundings seeking from things absent the help he does not obtain in things present? But these are all inadequate because the infinite abyss can only be filled by an infinite and immutable object that is to say only by God Himself

He only is our true good and since we have forsaken him it is a strange thing that there is nothing in nature which has not been serviceable in taking His place the stars the heavens earth the elements plants cabbages leeks animals insects calves serpents fever pestilence war famine vices adultery incest And since man has lost the true good everything can appear equally good to him even his own destruction though so opposed to God to reason and to the whole course of nature

Some seek good in authority others in scientific research others in pleasure Others who are in fact nearer the truth have considered it necessary that the universal good which all men desire should not consist in any of the particular things which can only be possessed by one man and which when shared afflict their possessors more by the want of the part he has not than they please him by the possession of what he has They have learned that the true good should be such as all can possess at once without diminution and without envy and which no one can lose against his will And their reason is that this desire being natural to man since it is necessarily in all and that it is impossible not to have it they infer from it

426 True nature being lost everything becomes its own nature as the true good being lost everything becomes its own true good

427 Man does not know in what rank to place himself He has plainly gone astray and fallen from his true place without being able to find it again He seeks it anxiously and unsuccessfully everywhere in impenetrable darkness

428 If it is a sign of weakness to prove God by nature do not despise Scripture if it is a sign of strength to have known these contradictions esteem Scripture

429 The vileness of man in submitting himself to the brutes and in even worshipping them

430 *For Port-Royal The beginning, after having explained the incomprehensibility* — The greatness and the wretchedness of man are so evident that the true religion must necessarily teach us both that there is in man some great source of greatness and a great source of wretchedness It must then give us a reason for these astonishing contradictions

In order to make man happy, it must prove to him that there is a God, that we ought to love Him, that our true happiness is to be in Him, and our sole evil to be separated from Him, it must recognise that we are full of darkness which hinders us from knowing and loving Him, and that thus, as our duties compel us to love God, and our lusts turn us away from Him, we are full of unrighteousness It must give us an explanation of our opposition to God and to our own good It must teach us the remedies for these infirmities and the means of obtaining these remedies Let us, therefore, examine all the religions of the world and see if there be any other than the Christian which is sufficient for this purpose

Shall it be that of the philosophers, who put forward, as the chief good, the good which is in ourselves? Is this the true good? Have they found the remedy for our ills? Is man s pride cured by placing him on an equality with God? Have those who have made us equal to the brutes, or the Mohammedans who have offered us earthly pleasures as the chief good even in eternity, produced the remedy for our lusts? What religion, then, will teach us to cure pride and lust? What religion will, in fact, teach us our good, our duties, the weakness which turns us from them, the cause of this weakness, the remedies which can cure it, and the means of obtaining these remedies?

All other religions have not been able to do so Let us see what the wisdom of God will do

Expect neither truth, she says, 'nor consolation from men I am she who formed you, and who alone can teach you what you are But you are now no longer in the state in which I formed you I created man holy, innocent, perfect I filled him with light and intelligence I communicated to him my glory and my wonders The eye of man saw then the majesty of God He was not then in the darkness which blinds him, nor subject to mortality and the woes which afflict him But he has not been able to sustain so great glory without falling into pride He wanted to make himself his own centre and independent of my help He withdrew himself from my rule, and, on his making himself equal to me by the desire of finding his happiness in himself, I abandoned him to himself And setting in revolt the creatures that were subject to him, I made them his enemies, so that man is now become like the brutes and so estranged from me that there scarce remains to him a dim vision of his Author So far has all his knowledge been extinguished or disturbed! The senses, independent of reason, and often the masters of reason, have led him into pursuit of pleasure All creatures either torment or tempt him, and domineer over him, either subduing him by their strength, or fascinating him by their charms, a tyranny more awful and more imperious

Such is the state in which men now are There remains to them some feeble instinct of the happiness of their former state, and they are plunged in the evils of their blindness and their lust, which have become their second nature

From this principle which I disclose to you you can recognize the cause of those contradictions which have astonished all men and have divided them into parties holding so different views Observe now all the feelings of greatness and glory which the experience of so many woes cannot stifle and see if the cause of them must not be in another nature

For Port Royal to morrow (Prosopopæa) — It is in vain O men that you seek within yourselves the remedy for your ills All your light can only reach the knowl edge that not in yourselves will you find truth or good The philosophers have promised you that and you have been unable to do it They neither know what is your true good nor what is your true state How could they have given remedies for your ills when they did not even know them? Your chief maladies are pride which takes you away from God and lust which binds you to earth and they have done nothing else but cherish one or other of these diseases If they gave you God as an end it was only to administer to your pride they made you think that you are by nature like Him and conformed to Him And those who saw the ab surdity of this claim put you on another precipice by making you understand that your nature was like that of the brutes and led you to seek your good in the lusts which are shared by the animals This is not the way to cure you of your unright eousness which these wise men never knew I alone can make you understand who you are

Adam Jesus Christ

If you are united to God it is by grace not by nature If you are humbled it is by penitence not by nature

Thus this double capacity

You are not in the state of your creation

As these two states are open it is impossible for you not to recognise them Fol low your own feelings observe yourselves and see if you do not find the lively characteristics of these two natures Could so many contradictions be found in a simple subject?

Incomprehensible Not all that is incomprehensible ceases to exist Infinite number An infinite space equal to a finite

Incredible that God should unite Himself to us This consideration is drawn only from the sight of our vileness But if you are quite sincere over it follow it as far as I have done and recognise that we are indeed so vile that we are incapable in ourselves of knowing if His mercy cannot make us capable of Him For I would know how this animal who knows himself to be so weak has the right to measure the mercy of God and set limits to it suggested by his own fancy He has so little knowledge of what God is that he does not know what he himself is and completely disturbed at the sight of his own state dares to say that God cannot make him capable of communion with Him

But I would ask him if God demands anything else from him than the knowl edge and love of Him and why since his nature is capable of love and knowl edge he believes that God cannot make Himself known and loved by him Doubtless he knows at least that he exists and that he loves something There fore if he sees anything in the darkness wherein he is and if he finds some object of his love among the things on earth why if God impart to him some ray of His essence will he not be capable of knowing and of loving Him in the manner in which it shall please Him to communicate Himself to us? There must then be

certainly an intolerable presumption in arguments of this sort, although they seem founded on an apparent humility, which is neither sincere nor reasonable, if it does not make us admit that, not knowing of ourselves what we are, we can only learn it from God

' I do not mean that you should submit your belief to me without reason, and I do not aspire to overcome you by tyranny In fact, I do not claim to give you a reason for everything And to reconcile these contradictions, I intend to make you see clearly, by convincing proofs, those divine signs in me, which may convince you of what I am, and may gain authority for me by wonders and proofs which you cannot reject, so that you may then believe without the things which I teach you, since you will find no other ground for rejecting them, except that you cannot know of yourselves if they are true or not

God has willed to redeem men and to open salvation to those who seek it But men render themselves so unworthy of it that it is right that God should refuse to some, because of their obduracy, what He grants others from a compassion which is not due to them If He had willed to overcome the obstinacy of the most hardened, He could have done so by revealing Himself so manifestly to them that they could not have doubted of the truth of His essence, as it will appear at the last day, with such thunders and such a convulsion of nature that the dead will rise again, and the blindest will see Him

It is not in this manner that He has willed to appear in His advent of mercy, because, as so many make themselves unworthy of His mercy, He has willed to leave them in the loss of the good which they do not want It was not, then, right that He should appear in a manner manifestly divine, and completely capable of convincing all men, but it was also not right that He should come in so hidden a manner that He could not be known by those who should sincerely seek Him He has willed to make Himself quite recognisable by those, and thus, willing to appear openly to those who seek Him with all their heart, and to be hidden from those who flee from Him with all their heart, He so regulates the knowledge of Himself that He has given signs of Himself, visible to those who seek Him, and not to those who seek Him not There is enough light for those who only desire to see, and enough obscurity for those who have a contrary disposition

431 No other religion has recognised that man is the most excellent creature Some, which have quite recognised the reality of his excellence, have considered as mean and ungrateful the low opinions which men naturally have of themselves, and others, which have thoroughly recognised how real is this vileness, have treated with proud ridicule those feelings of greatness, which are equally natural to man

Lift your eyes to God,' say the first, see Him whom you resemble and who has created you to worship Him You can make yourselves like unto Him, wisdom will make you equal to Him, if you will follow it Raise your heads, free men,' says Epictetus And others say, Bend your eyes to the earth, wretched worm that you are, and consider the brutes whose companion you are

What, then, will man become? Will he be equal to God or the brutes? What a frightful difference! What, then, shall we be? Who does not see from all this that man has gone astray, that he has fallen from his place, that he anxiously seeks it, that he cannot find it again? And who shall then direct him to it? The greatest men have failed

432 Scepticism is true for after all men before Jesus Christ did not know where they were nor whether they were great or small And those who have said the one or the other knew nothing about it and guessed without reason and by chance They also erred always in excluding the one or the other

Quod ergo ignorantes quæritis religio annuntiat vobis[1]

433 *After having understood the whole nature of man*—That a religion may be true it must have knowledge of our nature It ought to know its greatness and littleness and the reason of both What religion but the Christian has known this?

434 The chief arguments of the sceptics—I pass over the lesser ones—are that we have no certainty of the truth of these principles apart from faith and revelation except in so far as we naturally perceive them in ourselves Now this natural intuition is not a convincing proof of their truth since having no certainty apart from faith whether man was created by a good God or by a wicked demon or by chance it is doubtful whether these principles given to us are true or false or uncertain according to our origin Again no person is certain apart from faith whether he is awake or sleeps seeing that during sleep we believe that we are awake as firmly as we do when we *are* awake we believe that we see space figure and motion we are aware of the passage of time we measure it and in fact we act as if we were awake So that half of our life being passed in sleep we have on our own admission no idea of truth whatever we may imagine As all our intuitions are then illusions who knows whether the other half of our life in which we think we are awake is not another sleep a little different from the former from which we awake when we suppose ourselves asleep?

[And who doubts that if we dreamt in company and the dreams chanced to agree which is common enough and if we were always alone when awake we should believe that matters were reversed? In short as we often dream that we dream heaping dream upon dream may it not be that this half of our life wherein we think ourselves awake is itself only a dream on which the others are grafted from which we wake at death during which we have as few principles of truth and good as during natural sleep these different thoughts which disturb us being perhaps only illusions like the flight of time and the vain fancies of our dreams?]

These are the chief arguments on one side and the other

I omit minor ones such as the sceptical talk against the impressions of custom education manners country and the like Though these influence the majority of common folk, who dogmatise only on shallow foundations they are upset by the least breath of the sceptics We have only to see their books if we are not sufficiently convinced of this and we shall very quickly become so perhaps too much

I notice the only strong point of the dogmatists namely that speaking in good faith and sincerely we cannot doubt natural principles Against this the sceptics set up in one word the uncertainty of our origin which includes that of our nature The dogmatists have been trying to answer this objection ever since the world began

So there is open war among men in which each must take a part and side either

[1] "What you seek without knowing religion will announce to you Pascal misquotes Acts 17 23 "Whom therefore ye ignorantly worship him declare I unto you

with dogmatism or scepticism For he who thinks to remain neutral is above all a sceptic This neutrality is the essence of the sect, he who *is not against them* is essentially for them [In this appears their advantage] They are not for themselves, they are neutral, indifferent, in suspense as to all things, even themselves being no exception

What, then, shall man do in this state? Shall he doubt everything? Shall he doubt whether he is awake, whether he is being pinched, or whether he is being burned? Shall he doubt whether he doubts? Shall he doubt whether he exists? We cannot go so far as that, and I lay it down as a fact that there never has been a real complete sceptic Nature sustains our feeble reason and prevents it raving to this extent

Shall he, then, say, on the contrary, that he certainly possesses truth—he who, when pressed ever so little, can show no title to it and is forced to let go his hold?

What a chimera, then, is man! What a novelty! What a monster, what a chaos, what a contradiction, what a prodigy! Judge of all things, imbecile worm of the earth, depositary of truth, a sink of uncertainty and error, the pride and refuse of the universe!

Who will unravel this tangle? Nature confutes the sceptics, and reason confutes the dogmatists What, then, will you become, O men! who try to find out by your natural reason what is your true condition? You cannot avoid one of these sects, nor adhere to one of them

Know then, proud man, what a paradox you are to yourself Humble yourself, weak reason, be silent, foolish nature, learn that man infinitely transcends man, and learn from your Master your true condition, of which you are ignorant Hear God

For in fact, if man had never been corrupt, he would enjoy in his innocence both truth and happiness with assurance, and if man had always been corrupt, he would have no idea of truth or bliss But, wretched as we are, and more so than if there were no greatness in our condition, we have an idea of happiness and can not reach it We perceive an image of truth and possess only a lie Incapable of absolute ignorance and of certain knowledge, we have thus been manifestly in a degree of perfection from which we have unhappily fallen

It is, however, an astonishing thing that the mystery furthest removed from our knowledge, namely, that of the transmission of sin, should be a fact without which we can have no knowledge of ourselves For it is beyond doubt that there is nothing which more shocks our reason than to say that the sin of the first man has rendered guilty those who, being so removed from this source, seem incapable of participation in it This transmission does not only seem to us impossible, it seems also very unjust For what is more contrary to the rules of our miserable justice than to damn eternally an infant incapable of will, for a sin wherein he seems to have so little a share that it was committed six thousand years before he was in existence? Certainly nothing offends us *more rudely than this doctrine*, and yet without this mystery, the most incomprehensible of all, we are incomprehensible to ourselves The knot of our condition takes its twists and turns in this abyss, so that man is more inconceivable without this mystery than this mystery is inconceivable to man

[Whence it seems that God, willing to render the difficulty of our existence unintelligible to ourselves has concealed the knot so high, or, better speaking, so

low that we are quite incapable of reaching it so that it is not by the proud exertions of our reason but by the simple submissions of reason that we can truly know ourselves

These foundations solidly established on the inviolable authority of religion make us know that there are two truths of faith equally certain the one that man in the state of creation or in that of grace is raised above all nature made like unto God and sharing in His divinity the other that in the state of corruption and sin he is fallen from this state and made like unto the beasts

These two propositions are equally sound and certain Scripture manifestly declares this to us when it says in some places *Deliciæ meæ esse cum filiis hominum*[1] *Effundam spiritum meum super omnem carnem*[2] *Dii estis*[3] etc and in other places *Omnis caro fænum*[4] *Homo assimilatus est jumentis insipientibus et similis factus est illis*[5] *Dixi in corde meo de filiis hominum*[6]

Whence it clearly seems that man by grace is made like unto God and a partaker in His divinity and that without grace he is like unto the brute beasts]

435 Without this divine knowledge what could men do but either become elated by the inner feeling of their past greatness which still remains to them or become despondent at the sight of their present weakness? For not seeing the whole truth they could not attain to perfect virtue Some considering nature as incorrupt others as incurable they could not escape either pride or sloth the two sources of all vice since they cannot but either abandon themselves to it through cowardice or escape it by pride For if they knew the excellence of man they were ignorant of his corruption so that they easily avoided sloth but fell into pride And if they recognized the infirmity of nature they were ignorant of its dignity so that they could easily avoid vanity but it was to fall into despair Thence arise the different schools of the Stoics and Epicureans the Dogmatists Academicians etc

The Christian religion alone has been able to cure these two vices not by expelling the one through means of the other according to the wisdom of the world but by expelling both according to the simplicity of the Gospel For it teaches the righteous that it raises them even to a participation in divinity itself that in this lofty state they still carry the source of all corruption which renders them during all their life subject to error misery death and sin and it proclaims to the most ungodly that they are capable of the grace of their Redeemer So making those tremble whom it justifies and consoling those whom it condemns religion so justly tempers fear with hope through that double capacity of grace and of sin common to all that it humbles infinitely more than reason alone can do but without despair and it exalts infinitely more than natural pride but without inflating thus making it evident that alone being exempt from error and vice it alone fulfils the duty of instructing and correcting men

Who then can refuse to believe and adore this heavenly light? For is it not clearer than day that we perceive within ourselves ineffaceable marks of excel

[1]Prov 8 31 And my delights were with the sons of men
[2]Joel 2 28 I will pour out my spirit upon all flesh
[3]Ps 82 6 Ye are gods
[4]Is 40 6 All flesh is grass
[5]Ps 49 12 13 He is like the beasts that perish this their way is their folly
[6]Eccles 3 18 I said in mine heart concerning the estate of the sons of men.

lence? And is it not equally true that we experience every hour the results of our deplorable condition? What does this chaos and monstrous confusion proclaim to us but the truth of these two states, with a voice so powerful that it is impossible to resist it?

436 *Weakness*—Every pursuit of men is to get wealth, and they cannot have a title to show that they possess it justly, for they have only that of human caprice, nor have they strength to hold it securely It is the same with knowledge, for disease takes it away We are incapable both of truth and goodness

437 We desire truth, and find within ourselves only uncertainty
We seek happiness, and find only misery and death
We cannot but desire truth and happiness, and are incapable of certainty or happiness This desire is left to us, partly to punish us, partly to make us perceive wherefrom we are fallen

438 If man is not made for God, why is he only happy in God? If man is made for God, why is he so opposed to God?

439 *Nature corrupted*—Man does not act by reason, which constitutes his being

440 The corruption of reason is shown by the existence of so many different and extravagant customs It was necessary that truth should come, in order that man should no longer dwell within himself

441 For myself, I confess that, so soon as the Christian religion reveals the principle that human nature is corrupt and fallen from God, that opens my eyes to see everywhere the mark of this truth for nature is such that she testifies everywhere, both within man and without him, to a lost God and a corrupt nature

442 Man s true nature, his true good, true virtue, and true religion, are things of which the knowledge is inseparable

443 *Greatness, wretchedness*—The more light we have, the more greatness and the more baseness we discover in man Ordinary men—those who are more educated philosophers, they astonish ordinary men—Christians, they astonish philosophers
Who will then be surprised to see that religion only makes us know profoundly what we already know in proportion to our light?

444 This religion taught to her children what men have only been able to discover by their greatest knowledge

445 Original sin is foolishness to men, but it is admitted to be such You must not, then, reproach me for the want of reason in this doctrine, since I admit it to be without reason But this foolishness is wiser than all the wisdom of men,

sapientius est hominibus[1] For without this what can we say that man is? His whole state depends on this imperceptible point And how should it be perceived by his reason since it is a thing against reason and since reason far from finding it out by her own ways is averse to it when it is presented to her?

446 *Of original sin Ample tradition of original sin according to the Jews*

On the saying in Genesis 8 21 The imagination of man s heart is evil from his youth

R Moses Haddarschan This evil leaven is placed in man from the time that he is formed

Massechet Succa This evil leaven has seven names in Scripture It is called *evil the foreskin uncleanness an enemy a scandal a heart of stone the north wind* all this signifies the malignity which is concealed and impressed in the heart of man

Midrasch Tillim says the same thing and that God will deliver the good nature of man from the evil

This malignity is renewed every day against man as it is written Psalm xxxvii 32 The wicked watcheth the righteous and seeketh to slay him but God will not abandon him This malignity tries the heart of man in this life and will accuse him in the other All this is found in the Talmud

Midrasch Tillim on Psalm 4 4 Stand in awe and sin not Stand in awe and be afraid of your lust and it will not lead you into sin And on Psalm 36 1 The wicked has said within his own heart Let not the fear of God be before me That is to say that the malignity natural to man has said that to the wicked

Midrasch el Kohelet Better is a poor and wise child than an old and foolish king who cannot foresee the future The child is virtue and the king is the malignity of man It is called *king* because all the members obey it and *old* because it is in the human heart from infancy to old age and *foolish* because it leads man in the way of [*perdition*] which he does not foresee The same thing is in *Midrasch Tillim*

Bereschist Rabba on Psalm 35 10 Lord all my bones shall bless Thee which deliverest the poor from the tyrant And is there a greater tyrant than the evil leaven? And on Proverbs 25 21 If thine enemy be hungry give him bread to eat That is to say if the evil leaven hunger give him the bread of wisdom of which it is spoken in Proverbs 9 and if he be thirsty give him the water of which it is spoken in Isaiah 55

Midrasch Tillim says the same thing and that Scripture in that passage speaking of the enemy means the evil leaven and that in [*giving*] him that bread and that water we heap coals of fire on his head

Midrasch el Kohelet on Ecclesiastes 9 14 A great king besieged a little city This great king is the evil leaven the great bulwarks built against it are temptations *and there has been found a poor wise man* who has delivered it—that is to say virtue

And on Psalm 41 1 Blessed is he that considereth the poor

And on Psalm 78 39 The spirit passeth away and cometh not again whence some have erroneously argued against the immortality of the soul But the sense is that this spirit is the evil leaven which accompanies man till death and will not return at the resurrection

[1] I Cor 1 25 "The foolishness of God is wiser than men and the weakness of God is stronger than men.

And on Psalm 103 the same thing
And on Psalm 16
Principles of Rabbinism two Messiahs

447 Will it be said that, as men have declared that righteousness has departed the earth, they therefore knew of original sin?—*Nemo ante obitum beatus est*[1]—that is to say, they knew death to be the beginning of eternal and essential happiness?

448 [*Milton*] sees well that nature is corrupt and that men are averse to virtue, but he does not know why they cannot fly higher

449 *Order* —After *Corruption* to say It is right that all those who are in that state should know it, both those who are content with it, and those who are not content with it, but it is not right that all should see Redemption '

450 If we do not know ourselves to be full of pride, ambition, lust, weakness, misery, and injustice, we are indeed blind And if, knowing this, we do not desire deliverance, what can we say of a man ?

What, then, can we have but esteem for a religion which knows so well the defects of man, and desire for the truth of a religion which promises remedies so desirable?

451 All men naturally hate one another They employ lust as far as possible in the service of the public weal But this is only a [*pretence*] and a false image of love, for at bottom it is only hate

452 To pity the unfortunate is not contrary to lust On the contrary, we can quite well give such evidence of friendship, and acquire the reputation of kindly feeling, without giving anything

453 From lust men have found and extracted excellent rules of policy, morality, and justice, but in reality this vile root of man, this *figmentum malum*, is only covered, it is not taken away

454 *Injustice* —They have not found any other means of satisfying lust without doing injury to others

455 Self is hateful You, Milton, conceal it, you do not for that reason destroy it, you are, then, always hateful

No, for in acting as we do to oblige everybody, we give no more occasion for hatred of us That is true, if we only hated in Self the vexation which comes to us from it But if I hate it because it is unjust and because it makes itself the centre of everything, I shall always hate it

In a word, the Self has two qualities it is unjust in itself since it makes itself the centre of everything, it is inconvenient to others since it would enslave them, for

[1]Ovid, *Metamorphoses* iii 135 No one is happy before death

each Self is the enemy and would like to be the tyrant of all others You take away its inconvenience but not its injustice and so you do not render it lovable to those who hate injustice you render it lovable only to the unjust who do not any longer find in it an enemy And thus you remain unjust and can please only the unjust

456 It is a perverted judgement that makes every one place himself above the rest of the world and prefer his own good and the continuance of his own good fortune and life to that of the rest of the world!

457 Each one is all in all to himself for he being dead all is dead to him Hence it comes that each believes himself to be all in all to everybody We must not judge of nature by ourselves but by it

458 All that is in the world is the lust of the flesh or the lust of the eyes or the pride of life *libido sentiendi libido sciendi libido dominandi* [1] Wretched is the cursed land which these three rivers of fire enflame rather than water! Happy they who on these rivers are not overwhelmed nor carried away but are immovably fixed not standing but seated on a low and secure base whence they do not rise before the light but having rested in peace stretch out their hands to Him who must lift them up and make them stand upright and firm in the porches of the holy Jerusalem! There pride can no longer assail them nor cast them down and yet they weep not to see all those perishable things swept away by the torrents but at the remembrance of their loved country the heavenly Jerusalem which they remember without ceasing during their prolonged exile

459 The rivers of Babylon rush and fall and sweep away
O holy Zion where all is firm and nothing falls!

We must sit upon the waters not under them or in them but on them and not standing but seated being seated to be humble and being above them to be secure But we shall stand in the porches of Jerusalem

Let us see if this pleasure is stable or transitory if it pass away it is a river of Babylon

460 *The lust of the flesh the lust of the eyes pride etc* —There are three orders of things the flesh the spirit and the will The carnal are the rich and kings they have the body as their object Inquirers and scientists they have the mind as their object The wise they have righteousness as their object

God must reign over all and all men must be brought back to Him In things of the flesh lust reigns specially in intellectual matters inquiry specially in wisdom pride specially Not that a man cannot boast of wealth or knowledge but it is not the place for pride for in granting to a man that he is learned it is easy to convince him that he is wrong to be proud The proper place for pride is in wisdom for it cannot be granted to a man that he has made himself wise and that he is wrong to be proud for that is right Now God alone gives wisdom and that is why *Qui gloriatur in Domino glorietur* [2]

[1] I John 2 16
[2] I Cor 1 31 He that glorieth let him glory in the Lord

461 The three lusts have made three sects, and the philosophers have done no other thing than follow one of the three lusts

462 *Search for the true good* —Ordinary men place the good in fortune and external goods, or at least in amusement Philosophers have shown the vanity of all this and have placed it where they could

463 [*Against the philosophers who believe in God without Jesus Christ*]
Philosophers —They believe that God alone is worthy to be loved and admired, and they have desired to be loved and admired of men and do not know their own corruption If they feel full of feelings of love and admiration and find therein their chief delight, very well, let them think themselves good But if they find themselves averse to Him, if they have no inclination but the desire to establish themselves in the esteem of men, and if their whole perfection consists only in making men—but without constraint—find their happiness in loving them, I declare that this perfection is horrible What! they have known God and have not desired solely that men should love Him, but that men should stop short at them! They have wanted to be the object of the voluntary delight of men

464 *Philosophers* —We are full of things which take us out of ourselves
Our instinct makes us feel that we must seek our happiness outside ourselves Our passions impel us outside, even when no objects present themselves to excite them External objects tempt us of themselves, and call to us, even when we are not thinking of them And thus philosophers have said in vain Retire within yourselves, you will find your good there We do not believe them, and those who believe them are the most empty and the most foolish

465 The Stoics say, Retire within yourselves, it is there you will find your rest ' And that is not true
Others say, Go out of yourselves, seek happiness in amusement And this is not true Illness comes
Happiness is neither without us nor within us It is in God, both without us and within us

466 Had Epictetus seen the way perfectly, he would have said to men, ' You follow a wrong road ', he shows that there is another, but he does not lead to it It is the way of willing what God wills Jesus Christ alone leads to it *Via, veritas*[1]
The vices of Zeno himself

467 *The reason of effects* —Epictetus Those who say, You have a headache , this is not the same thing We are assured of health, and not of justice, and in fact his own was nonsense
And yet he believed it demonstrable, when he said, It is either in our power or it is not ' But he did not perceive that it is not in our power to regulate the heart, and he was wrong to infer from this the fact that there were some Christians

468 No other religion has proposed to men to hate themselves No other reli-

[1]John 14 6 I am the way the truth and the life

gion then can please those who hate themselves and who seek a Being truly lovable And these if they had never heard of the religion of a God humiliated would embrace it at once

469 I feel that I might not have been for the Ego consists in my thoughts Therefore I who think would not have been if my mother had been killed before I had life I am not then a necessary being In the same way I am not eternal or infinite but I see plainly that there exists in nature a necessary Being eternal and infinite

470 Had I seen a miracle say men I should become converted How can they be sure they would do a thing of the nature of which they are ignorant? They imagine that this conversion consists in a worship of God which is like commerce and in a communion such as they picture to themselves True religion consists in annihilating self before that Universal Being whom we have so often provoked and who can justly destroy us at any time in recognising that we can do nothing without Him and have deserved nothing from Him but His displeasure It consists in knowing that there is an unconquerable opposition between us and God and that without a mediator there can be no communion with Him

471 It is unjust that men should attach themselves to me even though they do it with pleasure and voluntarily I should deceive those in whom I had created this desire for I am not the end of any and I have not the wherewithal to satisfy them Am I not about to die? And thus the object of their attachment will die Therefore as I would be blamable in causing a falsehood to be believed though I should employ gentle persuasion though it should be believed with pleasure and though it should give me pleasure even so I am blamable in making myself loved and if I attract persons to attach themselves to me I ought to warn those who are ready to consent to a lie that they ought not to believe it whatever advantage comes to me from it and likewise that they ought not to attach themselves to me for they ought to spend their life and their care in pleasing God or in seeking Him

472 Self will will never be satisfied though it should have command of all it would but we are satisfied from the moment we renounce it Without it we cannot be discontented with it we cannot be content

473 Let us imagine a body full of thinking members

474 *Members To commence with that* —To regulate the love which we owe to ourselves we must imagine a body full of thinking members for we are members of the whole and must see how each member should love itself etc

475 If the feet and the hands had a will of their own they could only be in their order in submitting this particular will to the primary will which governs the whole body Apart from that they are in disorder and mischief but in willing only the good of the body they accomplish their own good

476 We must love God only and hate self only

If the foot had always been ignorant that it belonged to the body, and that there was a body on which it depended, if it had only had the knowledge and the love of self, and if it came to know that it belonged to a body on which it depended, what regret, what shame for its past life, for having been useless to the body which inspired its life, which would have annihilated it if it had rejected it and separated it from itself, as it kept itself apart from the body! What prayers for its preservation in it! And with what submission would it allow itself to be governed by the will which rules the body, even to consenting, if necessary, to be cut off, or it would lose its character as member! For every member must be quite willing to perish for the body, for which alone the whole is

477 It is false that we are worthy of the love of others, it is unfair that we should desire it If we were born reasonable and impartial, knowing ourselves and others, we should not give this bias to our will However, we are born with it, therefore born unjust, for all tends to self This is contrary to all order We must consider the general good, and the propensity to self is the beginning of all disorder, in war, in politics, in economy, and in the particular body of man The will is therefore depraved

If the members of natural and civil communities tend towards the weal of the body, the communities themselves ought to look to another more general body of which they are members We ought, therefore, to look to the whole We are, therefore, born unjust and depraved

478 When we want to think of God, is there nothing which turns us away, and tempts us to think of something else? All this is bad, and is born in us

479 If there is a God, we must love Him only and not the creatures of a day The reasoning of the ungodly in the Book of Wisdom is only based upon the nonexistence of God On that supposition, say they, let us take delight in the creatures ' That is the worst that can happen But if there were a God to love, they would not have come to this conclusion, but to quite the contrary And this is the conclusion of the wise There is a God, let us therefore not take delight in the creatures

Therefore all that incites us to attach ourselves to the creatures is bad, since it prevents us from serving God if we know Him, or from seeking Him if we know Him not Now we are full of lust Therefore we are full of evil, therefore we ought to hate ourselves and all that excited us to attach ourselves to any other object than God only

480 To make the members happy, they must have one will and submit it to the body

481 The examples of the noble deaths of the Lacedæmonians and others scarce touch us For what good is it to us? But the example of the death of the martyrs touches us, for they are our members We have a common tie with them Their resolution can form ours, not only by example, but because it has perhaps deserved ours There is nothing of this in the examples of the heathen We have no tie with them, as we do not become rich by seeing a stranger who is so, but in fact by seeing a father or a husband who is so

482 *Morality* —God having made the heavens and the earth which do not feel the happiness of their being He has willed to make beings who should know it and who should compose a body of thinking members For our members do not feel the happiness of their union of their wonderful intelligence of the care which has been taken to infuse into them minds and to make them grow and endure How happy they would be if they saw and felt it! But for this they would need to have intelligence to know it and good will to consent to that of the universal soul But if having received intelligence they employed it to retain nourishment for themselves without allowing it to pass to the other members they would be not only unjust but also miserable and would hate rather than love themselves their blessedness as well as their duty consisting in their consent to the guidance of the whole soul to which they belong which loves them better than they love themselves

483 To be a member is to have neither life being nor movement except *through the spirit of the body and for the body*

The separate member seeing no longer the body to which it belongs has only a perishing and dying existence Yet it believes it is a whole and seeing not the body on which it depends it believes it depends only on self and desires to make itself both centre and body But not having in itself a principle of life it only goes astray and is astonished in the uncertainty of its being perceiving in fact that it is not a body and still not seeing that it is a member of a body In short when it comes to know itself it has returned as it were to its own home and loves itself only for the body It deplores its past wanderings

It cannot by its nature love any other thing except for itself and to subject it to self because each thing loves itself more than all But in loving the body it loves itself because it only exists in it by it and for it *Qui adhæret Deo unus spiritus est* [1]

The body loves the hand and the hand if it had a will should love itself in the same way as it is loved by the soul All love which goes beyond this is unfair

Adhærens Deo unus spiritus est We love ourselves because we are members of Jesus Christ We love Jesus Christ because He is the body of which we are members All is one one is in the other like the Three Persons

484 Two laws suffice to rule the whole Christian Republic better than all the laws of statecraft

485 The true and only virtue then is to hate self (for we are hateful on account of lust) and to seek a truly lovable being to love But as we cannot love what is outside ourselves we must love a being who is in us and is not ourselves and that is true of each and all men Now only the Universal Being is such The kingdom of God is within us the universal good is within us is ourselves—and not ourselves

486 The dignity of man in his innocence consisted in using and having dominion over the creatures but now in separating himself from them and subjecting himself to them

487 Every religion is false which as to its faith does not worship one God as

[1] I Cor vi 17 But he that is joined unto the Lord is one spirit

the origin of everything and which, as to its morality, does not love one only God as the object of everything

488 *But it is impossible that God should* ever be the end, *if He is not the* beginning We lift our eyes on high, but lean upon the sand, and the earth will dissolve, and *we shall fall whilst looking at the heavens*

489 If there is one sole source of everything, there is one sole end of everything, everything through Him, everything for Him The true religion, then, must teach us to worship Him only, and to love Him only But as we find ourselves unable to worship what we know not, and to love any other object but ourselves, the religion which instructs us in these duties must instruct us also of this inability, and teach us also the remedies for it It teaches us that by one man all was lost, and the bond broken between God and us, and that by one man the bond is renewed

We are born so averse to this love of God and it is so necessary, that we must be born guilty, or God would be unjust

490 Men, not being accustomed to form merit, but only to recompense it where they find it formed, judge of God by themselves

491 The true religion must have as a characteristic the obligation to love God This is very just, and yet no other religion has commanded this, ours has done so It must also be aware of human lust and weakness, ours is so It must have adduced remedies for this, one is prayer No other religion has asked of God to love and follow Him

492 He who hates not in himself his self love, and that instinct which leads him to make himself God, is indeed blinded Who does not see that there is nothing so opposed to justice and truth? For it is false that we deserve this, and it is unfair and impossible to attain it, since all demand the same thing It is, then, a manifest injustice which is innate in us, of which we cannot get rid, and of which we must get rid

Yet no religion has indicated that this was a sin, or that we were born in it, or that we were obliged to resist it, or has thought of giving us remedies for it

493 The true religion teaches our duties, our weaknesses, pride, and lust, and the remedies, humility and mortification

494 The true religion must teach greatness and misery, must lead to the esteem and contempt of self, to love and to hate

495 If it is an extraordinary blindness to live without investigating what we are, it is a terrible one to live an evil life, while believing in God

496 Experience makes us see an enormous difference between piety and goodness

497 *Against those who, trusting to the mercy of God, live heedlessly, without doing good works* —As the two sources of our sins are pride and sloth, God has revealed to us

two of His attributes to cure them mercy and justice The property of justice is to humble pride however holy may be our works *et non intres in judicium* etc and the property of mercy is to combat sloth by exhorting to good works according to that passage The goodness of God leadeth to repentance and that other of the Ninevites Let us do penance to see if peradventure He will pity us And thus mercy is so far from authorising slackness that it is on the contrary the quality which formally attacks it so that instead of saying If there were no mercy in God we should have to make every kind of effort after virtue we must say on the contrary that it is because there is mercy in God that we must make every kind of effort

498 It is true there is difficulty in entering into godliness But this difficulty does not arise from the religion which begins in us but from the irreligion which is still there If our senses were not opposed to penitence and if our corruption were not opposed to the purity of God there would be nothing in this painful to us We suffer only in proportion as the vice which is natural to us resists supernatural grace Our heart feels torn asunder between these opposed efforts But it would be very unfair to impute this violence to God who is drawing us on instead of to the world which is holding us back It is as a child which a mother tears from the arms of robbers in the pain it suffers should love the loving and legitimate violence of her who procures its liberty and detest only the impetuous and tyrannical violence of those who detain it unjustly The most cruel war which God can make with men in this life is to leave them without that war which He came to bring I came to send war He says and to teach them of this war I came to bring fire and the sword Before Him the world lived in this false peace

499 *External works* —There is nothing so perilous as what pleases God and man For those states which please God and man have one property which pleases God and another which pleases men as the greatness of Saint Teresa What pleased God was her deep humility in the midst of her revelations what pleased men was her light And so we torment ourselves to imitate her discourses thinking to imitate her conditions and not so much to love what God loves and to put ourselves in the state which God loves

It is better not to fast and be thereby humbled than to fast and be self satisfied therewith The Pharisee and the Publican

What use will memory be to me if it can alike hurt and help me and all depends upon the blessing of God who gives only to things done for Him according to His rules and in His ways the manner being thus as important as the thing and perhaps more since God can bring forth good out of evil and without God we bring forth evil out of good?

500 The meaning of the words *good* and *evil*

501 First step to be blamed for doing evil and praised for doing good
Second step to be neither praised nor blamed

502 Abraham took nothing for himself but only for his servants So the righteous man takes for himself nothing of the world nor of the applause of the world

but only for his passions, which he uses as their master, saying to the one, "Go," and to another, Come " *Sub te erit appetitus tuus* [1] The passions thus subdued are virtues Even God attributes to Himself avarice, jealousy, anger, and these are virtues as well as kindness, pity, constancy, which are also passions We must employ them as slaves, and, leaving to them their food, prevent the soul from taking any of it For, when the passions become masters, they are vices, and they give their nutriment to the soul, and the soul nourishes itself upon it and is poisoned

503 Philosophers have consecrated the vices by placing them in God Himself Christians have consecrated the virtues

504 The just man acts by faith in the least things, when he reproves his servants, he desires their conversion by the Spirit of God, and prays God to correct them, and he expects as much from God as from his own reproofs, and prays God to bless his corrections And so in all his other actions he proceeds with the Spirit of God, and his actions deceive us by reason of the or suspension of the Spirit of God in him, and he repents in his affliction

505 All things can be deadly to us, even the things made to serve us, as in nature walls can kill us, and stairs can kill us, if we do not walk circumspectly

The least movement affects all nature, the entire sea changes because of a rock Thus, in grace, the least action affects everything by its consequences, therefore everything is important

In each action we must look beyond the action at our past, present, and future state, and at others whom it affects, and see the relations of all those things And then we shall be very cautious

506 Let God not impute to us our sins, that is to say, all the consequences and results of our sins, which are dreadful, even those of the smallest faults, if we wish to follow them out mercilessly!

507 *The spirit of grace, the hardness of the heart, external circumstances*

508 Grace is indeed needed to turn a man into a saint, and he who doubts it does not know what a saint or a man is

509 *Philosophers* —A fine thing to cry to a man who does not know himself, that he should come of himself to God! And a fine thing to say so to a man who does know himself!

510 Man is not worthy of God, but he is not incapable of being made worthy It is unworthy of God to unite Himself to wretched man, but it is not unworthy of God to pull him out of his misery

511 If we would say that man is too insignificant to deserve communion with God, we must indeed be very great to judge of it

[1] Gen 4 7 Unto thee shall be his desire

512 It is in peculiar phraseology wholly the body of Jesus Christ but it cannot be said to be the whole body of Jesus Christ The union of two things without change does not enable us to say that one becomes the other the soul thus being united to the body the fire to the timber without change But change is necessary to make the form of the one become the form of the other thus the union of the Word to man Because my body without my soul would not make the body of a man therefore my soul united to any matter whatsoever will make my body It does not distinguish the necessary condition from the sufficient condition the union is necessary but not sufficient The left arm is not the right

Impenetrability is a property of matter

Identity *de numero* in regard to the same time requires the identity of matter

Thus if God united my soul to a body in China the same body *idem numero* would be in China

The same river which runs there is *idem numero* as that which runs at the same time in China

513 Why God has established prayer

1 To communicate to His creatures the dignity of causality

2 To teach us from whom our virtue comes

3 To make us deserve other virtues by work

(But to keep His own pre eminence He grants prayer to whom He pleases)

Objection But we believe that we hold prayer of ourselves

This is absurd for since though having faith we cannot have virtues how should we have faith? Is there a greater distance between infidelity and faith than between faith and virtue?

Merit This word is ambiguous

Meruit habere Redemptorem [1]

Meruit tam sacra membra tangere [2]

Digno tam sacra membra tangere [3]

Non sum dignus [4]

Qui manducat indignus [5]

Dignus est accipere [6]

Dignare me [7]

God is only bound according to His promises He has promised to grant justice to prayers He has never promised prayer only to the children of promise

Saint Augustine has distinctly said that strength would be taken away from the righteous But it is by chance that he said it for it might have happened that the occasion of saying it did not present itself But his principles make us see that when the occasion for it presented itself it was impossible that he should not say it or that he should say anything to the contrary It is then rather that he was forced to say it when the occasion presented itself than that he said it when the

[1] Office for Holy Saturday Which won for us a Saviour

[2] Office for Good Friday Which won for us God s hallowed members to embrace

[3] Hymn *Vex* .. *reg* Worthy God s hallowed members to embrace

[4] Luke 7 6 I am not worthy

[5] I Cor 11 29 Who eateth unworthily

[6] Rev 4 11 Thou art worthy to receive

[7] Office of the Holy Virgin Make me worthy

occasion presented itself, the one being of necessity, the other of chance But the two are all that we can ask

514 Work out your own salvation with fear"

Proofs of prayer *Petenti dabitur*[1]

Therefore it is in our power to ask On the other hand, there is God So it is not in our power, since the obtaining of (the grace) to pray to Him is not in our power For since salvation is not in us, and the obtaining of such grace is from Him, prayer is not in our power

The righteous man should then hope no more in God, for he ought not to hope, but to strive to obtain what he wants

Let us conclude then that, since man is now unrighteous since the first sin, and God is unwilling that he should thereby not be estranged from Him, it is only by a first effect that he is not estranged

Therefore, those who depart from God have not this first effect without which they are not estranged from God, and those who do not depart from God have this first effect Therefore, those whom we have seen possessed for some time of grace by this first effect, cease to pray, for want of this first effect

Then God abandons the first in this sense

515 The elect will be ignorant of their virtues, and the outcast of the greatness of their sins Lord, when saw we Thee an hungered, thirsty ? etc

516 Romans 3 27 Boasting is excluded By what law? Of works? Nay, but by faith Then faith is not within our power like the deeds of the law, and it is given to us in another way

517 Comfort yourselves It is not from yourselves that you should expect grace, but, on the contrary, it is in expecting nothing from yourselves that you must hope for it

518 Every condition, and even the martyrs, have to fear, according to Scripture

The greatest pain of purgatory is the uncertainty of the judgement *Deus absconditus*[2]

519 John 8 *Multi crediderunt in eum Dicebat ergo Jesus Si manseritis* VERE *mei discipuli eritis, et* VERITAS LIBERABIT VOS *Responderunt Semen Abrahæ sumus, et nemini servimus unquam*[3]

There is a great difference between disciples and true disciples We recognise them by telling them that the truth will make them free, for if they answer that they are free and that it is in their power to come out of slavery to the devil, they are indeed disciples, but not true disciples

520 The law has not destroyed nature, but has instructed it, grace has not de-

[1]Matthew, 7 7, "Ask and it shall be given you

[2]Is 45 15

[3]30 33 Many believed on him Then Jesus said If ye continue then ye are my disciples indeed, and the truth shall make you free They answered him We be Abraham s seed and were never in bondage to any man

stroyed the law but has made it act Faith received at baptism is the source of the whole life of Christians and of the converted

521 Grace will always be in the world and nature also so that the former is in some sort natural And thus there will always be Pelagians and always Catholics and always strife because the first birth makes the one and the grace of the second birth the other

522 The law imposed what it did not give Grace gives what it imposes

523 All faith consists in Jesus Christ and in Adam and all morality in lust and in grace

524 There is no doctrine more appropriate to man than this which teaches him his double capacity of receiving and of losing grace because of the double peril to which he is exposed of despair or of pride

525 The philosophers did not prescribe feelings suitable to the two states

They inspired feelings of pure greatness and that is not man s state

They inspired feelings of pure littleness and that is not man s state

There must be feelings of humility not from nature but from penitence not to rest in them but to go on to greatness There must be feelings of greatness not from merit but from grace and after having passed through humiliation

526 Misery induces despair pride induces presumption The Incarnation shows man the greatness of his misery by the greatness of the remedy which he required

527 The knowledge of God without that of man s misery causes pride The knowledge of man s misery without that of God causes despair The knowledge of Jesus Christ constitutes the middle course because in Him we find both God and our misery

528 Jesus Christ is a God whom we approach without pride and before whom we humble ourselves without despair

529 Not a degradation which renders us incapable of good nor a holiness exempt from evil

530 A person told me one day that on coming from confession he felt great joy and confidence Another told me that he remained in fear Whereupon I thought that these two together would make one good man and that each was wanting in that he had not the feeling of the other The same often happens in other things

531 He who knows the will of his master will be beaten with more blows because of the power he has by his knowledge *Qui justus est justificetur adhuc*[1] because of the power he has by justice From him who has received most will the greatest reckoning be demanded because of the power he has by this help

[1] Rev 22 11 "He that is righteous let him be righteous still

532 Scripture has provided passages of consolation and of warning for all conditions

Nature seems to have done the same thing by her two infinities, natural and moral, for we shall always have the higher and the lower, the more clever and the less clever, the most exalted and the meanest, in order to humble our pride and exalt our humility

533 *Comminutum cor* (Saint Paul)[1] This is the Christian character *Alba has named you, I know you no more* (Corneille) That is the inhuman character The human character is the opposite

534 There are only two kinds of men the righteous who believe themselves sinners, the rest, sinners, who believe themselves righteous

535 We owe a great debt to those who point out faults For they mortify us They teach us that we have been despised They do not prevent our being so in the future, for we have many other faults for which we may be despised They prepare for us the exercise of correction and freedom from fault

536 Man is so made that by continually telling him he is a fool he believes it, and by continually telling it to himself he makes himself believe it For man holds an inward talk with his self alone, which it behoves him to regulate well *Corrumpunt bonos mores colloquia prava*[2] We must keep silent as much as possible and talk with ourselves only of God, whom we know to be true, and thus we convince ourselves of the truth

537 Christianity is strange It bids man recognise that he is vile, even abominable, and bids him desire to be like God Without such a counterpoise, this dignity would make him horribly vain, or this humiliation would make him terribly abject

538 With how little pride does a Christian believe himself united to God! With how little humiliation does he place himself on a level with the worms of earth!

A glorious manner to welcome life and death, good and evil!

539 What difference in point of obedience is there between a soldier and a Carthusian monk? For both are equally under obedience and dependent, both engaged in equally painful exercises But the soldier always hopes to command and never attains this, for even captains and princes are ever slaves and dependants still he ever hopes and ever works to attain this Whereas the Carthusian monk makes a vow to be always dependent So they do not differ in their perpetual thraldom, in which both of them always exist, but in the hope, which one always has, and the other never

540 The hope which Christians have of possessing an infinite good is mingled with real enjoyment as well as with fear, for it is not as with those who should

[1] *Circumcidentes cor* Rom 2 Circumcision is that of the heart
[2] I Cor 15 33 Evil communications corrupt good manners

hope for a kingdom of which they being subjects would have nothing but they hope for holiness for freedom from injustice and they have something of this

541 None is so happy as a true Christian nor so reasonable virtuous or amiable

542 The Christian religion alone makes man altogether *lovable and happy* In honesty we cannot perhaps be altogether lovable and happy

543 *Preface* —The metaphysical proofs of God are so remote from the reasoning of men and so complicated that they make little impression and if they should be of service to some it would be only during the moment that they see such demonstration but an hour afterwards they fear they have been mistaken

Quod curiositate cognoverunt superbia amiserunt [1]

This is the result of the knowledge of God obtained without Jesus Christ it is communion without a mediator with the God whom they have known without a mediator Whereas those who have known God by a mediator know their own wretchedness

544 The God of the Christians is a God who makes the soul feel that He is her only good that her only rest is in Him that her only delight is in loving Him and who makes her at the same time abhor the obstacles which keep her back and prevent her from loving God with all her strength Self love and lust which hinder us are unbearable to her Thus God makes her feel that she has this root of self love which destroys her and which He alone can cure

545 Jesus Christ did nothing but teach men that they loved themselves that they were slaves blind sick wretched and sinners that He must deliver them enlighten bless and heal them that this would be effected by hating self and by following Him through suffering and the death on the cross

546 Without Jesus Christ man must be in vice and misery with Jesus Christ man is free from vice and misery in Him is all our virtue and all our happiness Apart from Him there is but vice misery darkness death despair

547 We know God only by Jesus Christ Without this mediator all communion with God is taken away through Jesus Christ we know God All those who have claimed to know God and to prove Him without Jesus Christ have had only weak proofs But in proof of Jesus Christ we have the prophecies which are solid and palpable proofs And these prophecies being accomplished and proved true by the event mark the certainty of these truths and therefore the divinity of Christ In Him then and through Him we know God Apart from Him and without the Scripture without original sin without a necessary mediator promised and come we cannot absolutely prove God nor teach right doctrine and right morality But through Jesus Christ and in Jesus Christ we prove God and teach morality and doctrine Jesus Christ is then the true God of men

[1] Wh t they have found by their curiosity they have lost by their pride *Quod cu iositate* *co erunt superb a p d iserunt* St Augustine *Sermon* cxli.

But we know at the same time our wretchedness, for this God is none other than the Saviour of our wretchedness So we can only know God well by knowing our iniquities Therefore those who have known God, without knowing their wretchedness, have not glorified Him, but have glorified themselves *Quia non cognovit per sapientiam placuit Deo per stultitiam prædicationis salvos facere* [1]

548 Not only do we know God by Jesus Christ alone, but we know ourselves only by Jesus Christ We know life and death only through Jesus Christ Apart from Jesus Christ, we do not know what is our life, nor our death, nor God, nor ourselves

Thus without the Scripture, which has Jesus Christ alone for its object, we know nothing, and see only darkness and confusion in the nature of God and in our own nature

549 It is not only impossible but useless to know God without Jesus Christ They have not departed from Him, but approached, they have not humbled themselves, but

Quo quisque optimus est, pessimus, si hoc ipsum, quod optimus est, adscribat sibi [2]

550 I love poverty because He loved it I love riches because they afford me the means of helping the very poor I keep faith with everybody, I do not render evil to those who wrong me, but I wish them a lot like mine, in which I receive neither evil nor good from men I try to be just, true, sincere, and faithful to all men, I have a tender heart for those to whom God has more closely united me, and whether I am alone, or seen of men, I do all my actions in the sight of God, who must judge of them, and to whom I have consecrated them all

These are my sentiments, and every day of my life I bless my Redeemer, who has implanted them in me, and who, of a man full of weakness, of miseries of lust, of pride, and of ambition, has made a man free from all these evils by the power of His grace, to which all the glory of it is due, as of myself I have only misery and error

551 *Dignior plagis quam osculis non timeo quia amo* [3]

552 *The Sepulchre of Jesus Christ* —Jesus Christ was dead, but seen on the Cross He was dead, and hidden in the Sepulchre

Jesus Christ was buried by the saints alone

Jesus Christ wrought no miracle at the Sepulchre

Only the saints entered it

It is there, not on the Cross, that Jesus Christ takes a new life

It is the last mystery of the Passion and the Redemption

Jesus Christ had nowhere to rest on earth but in the Sepulchre His enemies only ceased to persecute Him at the Sepulchre

[1] I Cor i 21 Which by wisdom knew not it pleased God by the foolishness of preaching to save them that believe

[2] St Bernard, *Sermones in Cantica Canticorum* lxxxiv The better one is the worse one becomes, if one attributes the cause of this goodness to one's self

[3] *Ibid* Meriting blows more than kisses, I fear not because I love

553 *The Mystery of Jesus* —Jesus suffers in His passions the torments which men inflict upon Him but in His agony He suffers the torments which He inflicts on Himself *turbare semetipsum* [1] This is a suffering from no human but an almighty hand for He must be almighty to bear it

Jesus seeks some comfort at least in His three dearest friends and they are asleep He prays them to bear with Him for a little and they leave Him with entire indifference having so little compassion that it could not prevent their sleeping even for a moment And thus Jesus was left alone to the wrath of God

Jesus is alone on the earth without any one not only to feel and share His suffering but even to know of it He and Heaven were alone in that knowledge

Jesus is in a garden not of delight as the first Adam where he lost himself and the whole human race but in one of agony where He saved Himself and the whole human race

He suffers this affliction and this desertion in the horror of night

I believe that Jesus never complained but on this single occasion but then He complained as if he could no longer bear His extreme suffering My soul is sorrowful even unto death

Jesus seeks companionship and comfort from men This is the sole occasion in all His life as it seems to me But He receives it not for His disciples are asleep

Jesus will be in agony even to the end of the world We must not sleep during that time

Jesus in the midst of this universal desertion including that of His own friends chosen to watch with Him finding them asleep is vexed because of the danger to which they expose not Him but themselves He cautions them for their own safety and their own good with a sincere tenderness for them during their ingratitude and warns them that the spirit is willing and the flesh weak

Jesus finding them still asleep without being restrained by any consideration for themselves or for Him has the kindness not to waken them and leaves them in repose

Jesus prays uncertain of the will of His Father and fears death but when He knows it He goes forward to offer Himself to death *Eamus* [2] *Processit* (John) [3]

Jesus asked of men and was not heard

Jesus while His disciples slept wrought their salvation He has wrought that of each of the righteous while they slept both in their nothingness before their birth and in their sins after their birth

He prays only once that the cup pass away and then with submission and twice that it come if necessary

Jesus is weary

Jesus seeing all His friends asleep and all His enemies wakeful commits Himself entirely to His Father

Jesus does not regard in Judas his enmity but the order of God which He loves and admits since He calls him friend

Jesus tears Himself away from His disciples to enter into His agony we must tear ourselves away from our nearest and dearest to imitate Him

Jesus being in agony and in the greatest affliction let us pray longer

[1] John 11 33 *Et t ba it se ipsum* And he troubled himself
[2] Matt 26 46 "Let us be going
[3] 18 2 Jesus went forth

We implore the mercy of God, not that He may leave us at peace in our vices, but that He may deliver us from them

If God gave us masters by His own hand, oh! how necessary for us to obey them *with a good heart! Necessity and events follow infallibly*

Console thyself, thou wouldst not seek Me, if thou hadst not found Me

"I thought of thee in Mine agony, I have sweated such drops of blood for thee

It is tempting Me rather than proving thyself, to think if thou wouldst do such and such a thing on an occasion which has not happened, I shall act in thee if it occur

Let thyself be guided by My rules, see how well I have led the Virgin and the saints who have let Me act in them

The Father loves all that I do

"Dost thou wish that it always cost Me the blood of My humanity, without thy shedding tears?

"Thy conversion *is My affair, fear not, and pray with confidence as for Me*

I am present with thee by My Word in Scripture, by My Spirit in the Church and by inspiration, by My power in the priests, by My prayer in the faithful

Physicians will not heal thee, for thou wilt die at last But it is I who heal thee and make the body *immortal*

'Suffer bodily chains and servitude, I deliver thee at present only from spiritual servitude

"I am more a friend to thee than such and such an one, for I have done for thee more then they, they would not have suffered what I have suffered from thee, and they would not have died for thee as I have done in the time of thine infidelities and cruelties, and as I am ready to do, and do, among My elect and at the Holy Sacrament"

If thou knewest thy sins, thou wouldst lose heart

I shall lose it then, Lord, for on Thy assurance I believe their malice

No, for I, by whom thou learnest, can heal thee of them, and what I say to thee is a sign that I will heal thee *In proportion to thy expiation of them, thou wilt* know them, and it will be said to thee Behold, thy sins are forgiven thee Repent, then, for thy hidden sins, and for the secret malice of those which thou knowest

Lord, I give Thee all

I love thee more ardently than thou hast loved thine abominations, *ut immundus pro luto*

To Me be the glory, not to thee, worm of the earth

Ask thy confessor, when My own words are to thee occasion of evil, vanity, or curiosity"

I see in me depths of pride, curiosity, and lust There is no relation between me and God, nor Jesus Christ the Righteous But He has been made sin for me, all Thy scourges are fallen upon Him He is more abominable than I, and, far from abhorring me, He holds Himself honoured that I go to Him and succour Him

But He has healed Himself, and still more so will He heal me

I must add my wounds to His and join myself to Him, and He will save me in saving Himself But this must not be postponed to the future

Eritis sicut dii scientes bonum et malum[1] Each one creates his god when judging,

[1]Gen 3 5 Ye shall be as gods knowing good and evil

This is good or bad and men mourn or rejoice too much at events

Do little things as though they were great because of the majesty of Jesus Christ who does them in us and who lives our life and do the greatest things as though they were little and easy because of His omnipotence

554 It seems to me that Jesus Christ only allowed His wounds to be touched after His resurrection *Noli me tangere*[1] We must unite ourselves only to His sufferings

At the Last Supper He gave Himself in communion as about to die to the disciples at Emmaus as risen from the dead to the whole Church as ascended into heaven

555 Compare not thyself with others but with Me If thou dost not find Me in those with whom thou comparest thyself thou comparest thyself to one who is abominable If thou findest Me in them compare thyself to Me But whom wilt thou compare? Thyself or Me in thee? If it is thyself it is one who is abominable If it is I thou comparest Me to Myself Now I am God in all

I speak to thee and often counsel thee because thy director cannot speak to thee for I do not want thee to lack a guide

And perhaps I do so at his prayers and thus he leads thee without thy seeing it Thou wouldst not seek Me if thou didst not possess Me

Be not therefore troubled

SECTION VIII

THE FUNDAMENTALS OF THE CHRISTIAN RELIGION

556 Men blaspheme what they do not know The Christian religion consists in two points It is of equal concern to men to know them and it is equally dangerous to be ignorant of them And it is equally of God s mercy that He has given indications of both

And yet they take occasion to conclude that one of these points does not exist from that which should have caused them to infer the other The sages who have said there is only one God have been persecuted the Jews were hated and still more the Christians They have seen by the light of nature that if there be a true religion on earth the course of all things must tend to it as to a centre

The whole course of things must have for its object the establishment and the greatness of religion Men must have within them feelings suited to what religion teaches us And finally religion must so be the object and the centre to which all things tend that whoever knows the principles of religion can give an explanation both of the whole nature of man in particular and of the whole course of the world in general

And on this ground they take occasion to revile the Christian religion because they misunderstand it They imagine that it consists simply in the worship of a God considered as great powerful and eternal which is strictly deism almost as

[1] John 20 17 Touch me not

far removed from the Christian religion as atheism, which is its exact opposite And thence they conclude that this religion is not true, because they do not see that all things concur to the establishment of this point, that God does not manifest Himself to men with all the evidence which He could show

But let them conclude what they will against deism, they will conclude nothing against the Christian religion, which properly consists in the mystery of the Redeemer, who, uniting in Himself the two natures, human and divine, has redeemed *men from the corruption of sin in order to reconcile them in His divine* person to God

The Christian religion, then, teaches men these two truths, that there is a God whom men can know, and that there is a corruption in their nature which renders them unworthy of Him It is equally important to men to know both these points, and it is equally dangerous for man to know God without knowing his own wretchedness, and to know his own wretchedness without knowing the Redeemer who can free him from it The knowledge of only one of these points gives rise either to the pride of philosophers, who have known God, and not their own wretchedness, or to the despair of atheists, who know their own wretchedness, but not the Redeemer

And, as it is alike necessary to man to know these two points, so is it alike merciful of God to have made us know them The Christian religion does this, it is in this that it consists

Let us herein examine the order of the world and see if all things do not tend to establish these two chief points of this religion Jesus Christ is the end of all, and the centre to which all tends Whoever knows Him knows the reason of everything

Those who fall into error err only through *failure to see one of these two things We can, then, have an excellent knowledge of God without that of our own wretched*ness and of our own wretchedness without that of God But we cannot know Jesus Christ without knowing at the same time both God and our own wretchedness

Therefore I shall not undertake here to prove by natural reasons either the existence of God, or the Trinity, or the immortality of the soul, or anything of that nature, not only because I should not feel myself sufficiently able to find in nature arguments to convince hardened atheists, but also because such knowledge without Jesus Christ is useless and barren Though a man should be convinced that numerical proportions are immaterial truths, eternal and dependent on a first truth, in which they subsist and which is called God, I should not think him far advanced towards his own salvation

The God of Christians is not a God who is simply the author of mathematical truths, or *of the order of the elements, that is the view of heathens and Epicureans* He is not merely a God who exercises His providence over the life and fortunes of men, to bestow on those who worship Him a long and happy life That was the portion of the Jews But the God of Abraham, the God of Isaac, the God of Jacob, the God of Christians, is a God of love and of comfort, a God who fills the soul and heart of those whom He possesses, a God who makes them conscious of their inward wretchedness, and His infinite mercy, who unites Himself to their inmost soul, who fills it with humility and joy, with confidence and love, who renders them incapable of any other end than Himself

All who seek God without Jesus Christ, and who rest in nature, either find no light to satisfy them, or come to form for themselves a means of knowing God

and serving Him without a mediator Thereby they fall either into atheism or into deism two things which the Christian religion abhors almost equally

Without Jesus Christ the world would not exist for it should needs be either that it would be destroyed or be a hell

If the world existed to instruct man of God His divinity would shine through every part in it in an indisputable manner but as it exists only by Jesus Christ and for Jesus Christ and to teach men both their corruption and their redemption all displays the proofs of these two truths

All appearance indicates neither a total exclusion nor a manifest presence of divinity but the presence of a God who hides Himself Everything bears this character

Shall he alone who knows his nature know it only to be miserable? Shall he alone who knows it be alone unhappy?

He must not see nothing at all nor must he see sufficient for him to believe he possesses it but he must see enough to know that he has lost it For to know of his loss he must see and not see and that is exactly the state in which he naturally is

Whatever part he takes I shall not leave him at rest

557 It is then true that everything teaches man his condition but he must understand this well For it is not true that all reveals God and it is not true that all conceals God But it is at the same time true that He hides Himself from those who tempt Him and that He reveals Himself to those who seek Him because men are both unworthy and capable of God unworthy by their corruption capable by their original nature

558 What shall we conclude from all our darkness but our unworthiness?

559 If there never had been any appearance of God this eternal deprivation would have been equivocal and might have as well corresponded with the absence of all divinity as with the unworthiness of men to know Him but His occasional though not continual appearances remove the ambiguity If He appeared once He exists always and thus we cannot but conclude both that there is a God and that men are unworthy of Him

560 We do not understand the glorious state of Adam nor the nature of his sin nor the transmission of it to us These are matters which took place under conditions of a nature altogether different from our own and which transcend our present understanding

The knowledge of all this is useless to us as a means of escape from it and all that we are concerned to know is that we are miserable corrupt separated from God but ransomed by Jesus Christ whereof we have wonderful proofs on earth

So the two proofs of corruption and redemption are drawn from the ungodly who live in indifference to religion and from the Jews who are irreconcilable enemies

561 There are two ways of proving the truths of our religion one by the power of reason the other by the authority of him who speaks

We do not make use of the latter, but of the former We do not say, "This must be believed, for Scripture, which says it, is divine But we say that it must be believed for such and such a *reason*, which are feeble arguments, as *reason* may be bent to everything

562 There is nothing on earth that does not show either the wretchedness of man, or the mercy of God, either the weakness of man without God, or the strength of man with God

563 It will be one of the confusions of the damned to see that they are condemned by their own reason, by which they claimed to condemn the Christian religion

564 The prophecies, the very miracles and proofs of our religion, are not of such a nature that they can be said to be absolutely convincing But they are also of such a kind that it cannot be said that it is unreasonable to believe them Thus there is both evidence and obscurity to enlighten some and confuse others But the evidence is such that it surpasses, or at least equals, the evidence to the contrary, so that it is not reason which can determine men not to follow it, and thus it can only be lust or malice of heart And by this means there is sufficient evidence to condemn, and insufficient to convince, so that it appears in those who follow it that it is grace, and not reason, which makes them follow it, and in those who shun it, that it is lust, not reason, which makes them shun it

Vere discipuli, vere Israëlita, vere liberi, vere cibus [1]

565 Recognise, then, the truth of religion in the very obscurity of religion, in the little light we have of it, and in the indifference which we have to knowing it

566 We understand nothing of the works of God, if we do not take as a principle that He has willed to blind some and enlighten others

567 The two contrary reasons We must begin with that, without that we understand nothing, and all is heretical, and we must even add at the end of each truth that the opposite truth is to be remembered

568 *Objection* The Scripture is plainly full of matters not dictated by the Holy Spirit *Answer* Then they do not harm faith *Objection* But the Church has decided that all is of the Holy Spirit *Answer* I answer two things first, the Church has not so decided, secondly, if she should so decide, it could be maintained

Do you think that the prophecies cited in the Gospel are related to make you believe? No, it is to keep you from believing

569 *Canonical*—The heretical books in the beginning of the Church serve to prove the canonical

570 To the chapter on the *Fundamentals* must be added that on *Typology* touch-

[1]Allusion to John 6 56, 1 47 8 36 6 32 True disciple an Israelite indeed free indeed true bread

ing the reason of types why Jesus Christ was prophesied as to His first coming why prophesied obscurely as to the manner

571 *The reason why Types*—[They had to deal with a carnal people and to render them the depositary of the spiritual covenant] To give faith to the Messiah it was necessary there should have been precedent prophesies and that these should be conveyed by persons above suspicion diligent faithful unusually zealous and known to all the world

To accomplish all this God chose this carnal people to whom He entrusted the prophecies which foretell the Messiah as a deliverer and as a dispenser of those carnal goods which this people loved And thus they have had an extraordinary passion for their prophets and in sight of the whole world have had charge of these books which foretell their Messiah assuring all nations that He should come and in the way foretold in the books which they held open to the whole world Yet this people deceived by the poor and ignominious advent of the Messiah have been His most cruel enemies So that they the people least open to suspicion in the world of favouring us the most strict and most zealous that can be named for their law and their prophets have kept the books incorrupt Hence those who have rejected and crucified Jesus Christ who has been to them an offence are those who have charge of the books which testify of Him and state that He will be an offence and rejected Therefore they have shown it was He by rejecting Him and He has been alike proved both by the righteous Jews who received Him and by the unrighteous who rejected Him both facts having been foretold

Wherefore the prophecies have a hidden and spiritual meaning to which this people were hostile under the carnal meaning which they loved If the spiritual meaning had been revealed they would not have loved it and unable to bear it they would not have been zealous of the preservation of their books and their ceremonies and if they had loved these spiritual promises and had preserved them incorrupt till the time of the Messiah their testimony would have had no force because they had been his friends

Therefore it was well that the spiritual meaning should be concealed but on the other hand if this meaning had been so hidden as not to appear at all it could not have served as a proof of the Messiah What then was done? In a crowd of passages it has been hidden under the temporal meaning and in a few has been clearly revealed besides that the time and the state of the world have been so clearly foretold that it is clearer than the sun And in some places this spiritual meaning is so clearly expressed that it would require a blindness like that which the flesh imposes on the spirit when it is subdued by it not to recognise it

See then what has been the prudence of God This meaning is concealed under another in an infinite number of passages and in some though rarely it is revealed but yet so that the passages in which it is concealed are equivocal and can suit both meanings whereas the passages where it is disclosed are unequivocal and can only suit the spiritual meaning

So that this cannot lead us into error and could only be misunderstood by so carnal a people

For when blessings are promised in abundance what was to prevent them from understanding the true blessings but their covetousness which limited the meaning to worldly goods? But those whose only good was in God referred them to

God alone For there are two principles, which divide the wills of men, covetousness and charity Not that covetousness cannot exist along with faith in God, nor charity with worldly riches, but covetousness uses God and enjoys the world, and charity is the opposite

Now the ultimate end gives names to things All which prevents us from attaining it is called an enemy to us Thus the creatures, however good, are the enemies of the righteous, when they turn them away from God, and God Himself is the enemy of those whose covetousness He confounds

Thus as the significance of the word *enemy* is dependent on the ultimate end, the righteous understood by it their passions, and the carnal the Babylonians, and so these terms were obscure only for the unrighteous And this is what Isaiah says *Signa legem in electis meis*,[1] and that Jesus Christ shall be a stone of stumbling But, Blessed are they who shall not be offended in him " Hosea, 14 9, says excellently, Where is the wise? and he shall understand what I say The righteous shall know them, for the ways of God are right, but the transgressors shall fall therein

572 Hypothesis that the apostles were impostors The time clearly, the manner obscurely Five typical proofs

2000 { 1600 prophets / 400 scattered }

573 *Blindness of Scripture* — The Scripture,' said the Jews, ' says that we shall not know whence Christ will come (John 7 27, and 12 34) The Scripture says that Christ abideth for ever, and He said that He should die Therefore, says Saint John, they believed not, though He had done so many miracles, that the word of Isaiah might be fulfilled He hath blinded them, etc

574 *Greatness* —Religion is so great a thing that it is right that those who will not take the trouble to seek it, if it be obscure, should be deprived of it Why, then, do any complain, if it be such as can be found by seeking?

575 All things work together for good to the elect, even the obscurities of Scripture, for they honour them because of what is divinely clear And all things work together for evil to the rest of the world, even what is clear, for they revile such, because of the obscurities which they do not understand

576 *The general conduct of the world towards the Church God willing to blind and to enlighten* —The event having proved the divinity of these prophecies, the rest ought to be believed And thereby we see the order of the world to be of this kind The miracles of the Creation and the Deluge being forgotten, God sends the law and the miracles of Moses, the prophets who prophesied particular things and to prepare a lasting miracle, He prepares prophecies and their fulfilment, but, as the prophecies could be suspected, He desires to make them above suspicion, etc

577 God has made the blindness of this people subservient to the good of the elect

[1] *In discipulis meis* Isaiah 8 16 Seal the law among my disciples

578 There is sufficient clearness to enlighten the elect and sufficient obscurity to humble them There is sufficient obscurity to blind the reprobate and sufficient clearness to condemn them and make them inexcusable Saint Augustine Montaigne Sébond

The genealogy of Jesus Christ in the Old Testament is intermingled with so many others that are useless that it cannot be distinguished If Moses had kept only the record of the ancestors of Christ that might have been too plain If he had not noted that of Jesus Christ it might not have been sufficiently plain But after all whoever looks closely sees that of Jesus Christ expressly traced through Tamar Ruth etc

Those who ordained these sacrifices knew their uselessness those who have declared their uselessness have not ceased to practise them

If God had permitted only one religion it has been too easily known but when we look at it closely we clearly discern the truth amidst this confusion

The premiss —Moses was a clever man If then he ruled himself by his reason he would say nothing clearly which was directly against reason

Thus all the very apparent weaknesses are strength Example the two genealogies in Saint Matthew and Saint Luke What can be clearer than that this was not concerted?

579 God (and the Apostles) foreseeing that the seeds of pride would make heresies spring up and being unwilling to give them occasion to arise from correct expressions has put in Scripture and the prayers of the Church contrary words and sentences to produce their fruit in time

So in morals He gives charity which produces fruits contrary to lust

580 Nature has some perfections to show that she is the image of God and some defects to show that she is only His image

581 God prefers rather to incline the will than the intellect Perfect clearness would be of use to the intellect and would harm the will To humble pride

582 We make an idol of truth itself for truth apart from charity is not God but His image and idol which we must neither love nor worship and still less must we love or worship its opposite namely falsehood

I can easily love total darkness but if God keeps me in a state of semi darkness such partial darkness displeases me and because I do not see therein the advantage of total darkness it is unpleasant to me This is a fault and a sign that I make for myself an idol of darkness apart from the order of God Now only His order must be worshipped

583 The feeble minded are people who know the truth but only affirm it so far as consistent with their own interest But apart from that they renounce it

584 The world exists for the exercise of mercy and judgement not as if men were placed in it out of the hands of God but as hostile to God and to them He grants by grace sufficient light that they may return to Him if they desire to seek

and follow Him, and also that they may be punished, if they refuse to seek or follow Him

585 *That God has willed to hide Himself*—If there were only one religion, God would indeed be manifest The same would be the case if there were no martyrs but in our religion

God being thus hidden, every religion which does not affirm that God is hidden is not true, and every religion which does not give the reason of it is not instructive Our religion does all this *Vere tu es Deus absconditus* [1]

586 If there were no obscurity, man would not be sensible of his corruption, if there were no light, man would not hope for a remedy Thus, it is not only fair, but advantageous to us, that God be partly hidden and partly revealed, since it is equally dangerous to man to know God without knowing his own wretchedness, and to know his own wretchedness without knowing God

587 This religion, so great in miracles, saints, blameless Fathers, learned and great witnesses, martyrs, established kings as David, and Isaiah, a prince of the blood, and so great in science, after having displayed all her miracles and all her wisdom, rejects all this, and declares that she has neither wisdom nor signs, but only the cross and foolishness

For those, who, by these signs and that wisdom, have deserved your belief, and who have proved to you their character, declare to you that nothing of all this can change you, and render you capable of knowing and loving God, but the power of the foolishness of the cross without wisdom and signs, and not the signs without this power Thus our religion is foolish in respect to the effective cause and wise in respect to the wisdom which prepares it

588 Our religion is wise and foolish Wise, because it is the most learned and the most founded on miracles, prophecies, etc Foolish, because it is not all this which makes us belong to it This makes us, indeed, condemn those who do not belong to it, but it does not cause belief in those who do belong to it It is the cross that makes them believe, *ne evacuata sit crux* [2] And so Saint Paul, who came with wisdom and signs, says that he has come neither with wisdom nor with signs, for he came to convert But those who come only to convince can say that they come with wisdom and with signs

SECTION IX

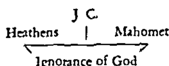
PERPETUITY

589 *On the fact that the Christian religion is not the only religion* —So far is this from being a reason for believing that it is not the true one that, on the contrary, it makes us see that it is so

[1] Is 45 15
[2] I Cor 1 17 Lest the cross of Christ should be made of none effect.

590 Men must be sincere in all religions true heathens true Jews true Christians

591



592 *The falseness of other religions* —They have no witnesses Jews have God defies other religions to produce such signs Isaiah 43 9 44 8

593 *History of China* —I believe only the histories whose witnesses got themselves killed

[Which is the more credible of the two Moses or China?]

It is not a question of seeing this summarily I tell you there is in it something to blind and something to enlighten

By this one word I destroy all your reasoning But China obscures say you and I answer China obscures but there is clearness to be found seek it

Thus all that you say makes for one of the views and not at all against the other So this serves and does no harm

We must then see this in detail we must put the papers on the table

594 *Against the history of China* —The historians of Mexico the five suns of which the last is only eight hundred years old

The difference between a book accepted by a nation and one which makes a nation

595 Mahomet was without authority His reasons then should have been very strong having only their own force What does he say then that we must believe him?

596 The Psalms are chanted throughout the whole world

Who renders testimony to Mahomet? Himself Jesus Christ desires His own testimony to be as nothing

The quality of witnesses necessitates their existence always and everywhere and he miserable creature is alone

597 *Against Mahomet* —The Koran is not more of Mahomet than the Gospel is of Saint Matthew for it is cited by many authors from age to age Even its very enemies Celsus and Porphyry never denied it

The Koran says Saint Matthew was an honest man Therefore Mahomet was a false prophet for calling honest men wicked or for not agreeing with what they have said of Jesus Christ

598 It is not by that which is obscure in Mahomet and which may be interpreted in a mysterious sense that I would have him judged but by what is clear as his paradise and the rest In that he is ridiculous And since what is clear is ridiculous it is not right to take his obscurities for mysteries

It is not the same with the Scripture I agree that there are in it obscurities as *strange as those of Mahomet*, but there are admirably clear passages, and the prophecies are manifestly fulfilled The cases are, therefore, not on a par We must not confound and put on one level things which only resemble each other in their obscurity, and not in the clearness, which requires us to reverence the obscurities

599 *The difference between Jesus Christ and Mahomet* —Mahomet was not foretold, Jesus Christ was foretold

Mahomet slew, Jesus Christ caused His own to be slain

Mahomet forbade reading, the Apostles ordered reading

In fact, the two are so opposed that, if Mahomet took the way to succeed from a worldly point of view, Jesus Christ, from the same point of view, took the way to perish And instead of concluding that, since Mahomet succeeded, Jesus Christ might well have succeeded, we ought to say that, since Mahomet succeeded, Jesus Christ should have failed

600 Any man can do what Mahomet has done, for he performed no miracles, he was not foretold No man can do what Christ has done

601 The heathen religion has no foundation [at the present day It is said once to have had a foundation by the oracles which spoke But what are the books which assure us of this? Are they so worthy of belief on account of the virtue of their authors? Have they been preserved with such care that we can be sure that they have not been meddled with?]

The Mahometan religion has for a foundation the Koran and Mahomet But has this prophet, who was to be the last hope of the world, been foretold? What sign has he that every other man has not who chooses to call himself a prophet? What miracles does he himself say that he has done? What mysteries has he taught, even according to his own tradition? What was the morality, what the happiness held out by him?

The Jewish religion must be differently regarded in the tradition of the Holy Bible and in the tradition of the people Its morality and happiness are absurd in the tradition of the people, but are admirable in that of the Holy Bible (And all religion is the same, for the Christian religion is very different in the Holy Bible and in the casuists) The foundation is admirable, it is the most ancient book in the world, and the most authentic, and whereas Mahomet, in order to make his own book continue in existence, forbade men to read it, Moses, for the same reason, ordered every one to read his

Our religion is so divine that another divine religion has only been the foundation of it

602 *Order* —To see what is clear and indisputable in the whole state of the Jews

603 The Jewish religion is wholly divine in its authority, its duration, its perpetuity, its morality, its doctrine, and its effects

604 The only science contrary to common sense and human nature is that alone which has always existed among men

605 The only religion contrary to nature to common sense and to our pleasure is that alone which has always existed

606 No religion but our own has taught that man is born in sin No sect of philosophers has said this Therefore none have declared the truth

No sect or religion has always existed on earth but the Christian religion

607 Whoever judges of the Jewish religion by its coarser forms will misunderstand it It is to be seen in the Holy Bible and in the tradition of the prophets who have made it plain enough that they did not interpret the law according to the letter So our religion is divine in the Gospel in the Apostles and in tradition but it is absurd in those who tamper with it

The Messiah according to the carnal Jews was to be a great temporal prince Jesus Christ according to carnal Christians has come to dispense us from the love of God and to give us sacraments which shall do everything without our help Such is not the Christian religion nor the Jewish True Jews and true Christians have always expected a Messiah who should make them love God and by that love triumph over their enemies

608 The carnal Jews hold a midway place between Christians and heathens The heathens know not God and love the world only The Jews know the true God and love the world only The Christians know the true God and love not the world Jews and heathens love the same good Jews and Christians know the same God

The Jews were of two kinds the first had only heathen affections the other had Christian affections

609 There are two kinds of men in each religion among the heathen worshippers of beasts and the worshippers of the one only God of natural religion among the Jews the carnal and the spiritual who were the Christians of the old law among Christians the coarser minded who are the Jews of the new law The carnal Jews looked for a carnal Messiah the coarser Christians believe that the Messiah has dispensed them from the love of God true Jews and true Christians worship a Messiah who makes them love God

610 *To show that the true Jews and the true Christians have but the same religion* — The religion of the Jews seemed to consist essentially in the fatherhood of Abraham in circumcision in sacrifices in ceremonies in the Ark in the temple in Jerusalem and finally in the law and in the covenant with Moses

I say that it consisted in none of those things but only in the love of God and that God disregarded all the other things

That God did not accept the posterity of Abraham

That the Jews were to be punished like strangers if they transgressed Deut 8 19 If thou do at all forget the Lord thy God and walk after other gods I testify against you this day that ye shall surely perish as the nations which the Lord destroyeth before your face

That strangers if they loved God were to be received by Him as the Jews Isaiah 56 3 Let not the stranger say The Lord will not receive me The strangers

who join themselves unto the Lord to serve Him and love Him, will I bring unto my holy mountain, and accept therein sacrifices, for mine house is a house of prayer '

That the true Jews considered *their merit to be from God only, and not from* Abraham Isaiah 63 16 Doubtless thou art our Father, though Abraham be ignorant of us, and Israel acknowledge us not Thou art our Father and our Redeemer

Moses himself told them that God would not accept persons Deut 10 17 'God, ' said he, regardeth neither persons nor sacrifices

The Sabbath was only a sign, Exod 31 13, and in memory of the escape from Egypt, Deut 5 19 Therefore it is no longer necessary, since Egypt must be forgotten

Circumcision was only a sign, Gen 17 11 And thence it came to pass that, being in the desert, they were not circumcised, because they could not be confounded with other peoples, and after Jesus Christ came, *it was no longer necessary*

That the circumcision of the heart is commanded Deut 10 16, Jeremiah 4 4 Be ye circumcised in heart, take away the superfluities of your heart, and harden yourselves not For your God is a mighty God, strong and terrible, who accepteth not persons '

That God said He would one day do it Deut 30 6 God will circumcise thine heart, and the heart of thy seed, that thou mayest love Him with all thine heart '

That the uncircumcised in heart shall be judged Jeremiah 9 26 For God will judge the uncircumcised peoples, and all the people of Israel, because he is uncircumcised in heart

That the external is of no avail apart from the internal Joel 2 13 *Scindite corda vestra,*[1] etc , Isaiah 58 3, 4, etc

The love of God is enjoined in the whole of Deuteronomy Deut 30 19 I *call heaven and earth to record that I have set before you life and death, that you* should choose life, and love God, and obey Him, for God is your life "

That the Jews, for lack of that love, should be rejected for their offences, and the heathen chosen in their stead Hosea 1 10, Deut 32 20 I will hide my face from them, I will see what their end shall be, for they are a very froward generation, children in whom is no faith They have moved me to jealousy with that which is not God and I will move them to jealousy with those which are not a people and with a foolish nation Isaiah 65 1

That temporal goods are false, and that the true good is to be united to God Psalm 143 15

That their feasts are displeasing to God Amos 5 21

That the sacrifices of the Jews displeased God Isaiah 66 1–3, 1 11, Jer 6 20, David, *Miserere*[2] Even on the part of the good *Expectavi*[3] Psalm 49 8, 9, 10, 11, 12, 13 and 14

That He has established them only for their hardness Micah, admirably, 6, I Kings 15 22, Hosea 6 6

[1] Rend your heart
[2] Ps 9 14 Have mercy
[3] Is 5 7 He has looked for

That the sacrifices of the Gentiles will be accepted of God and that God will take no pleasure in the sacrifices of the Jews Malachi 1 11

That God will make a new covenant with the Messiah and the old will be annulled Jer 31 31 *Mandata non bona* Ezek [1]

That the old things will be forgotten Isaiah 43 18 19 65 17 10

That the Ark will no longer be remembered Jer 3 15 16

That the temple should be rejected Jer 7 12 13 14

That the sacrifices should be rejected and other pure sacrifices established Malachi 1 11

That the order of Aaron s priesthood should be rejected and that of Melchizedek introduced by the Messiah Ps *Dixit Dominus*

That this priesthood should be eternal *Ibid*

That Jerusalem should be rejected and Rome admitted *Ibid*

That the name of the Jews should be rejected and a new name given Isaiah 65 15

That this last name should be more excellent than that of the Jews and eternal Isaiah 56 5

That the Jews should be without prophets (Amos) without a king without princes without sacrifice without an idol

That the Jews should nevertheless always remain a people Jer 31 36

611 *Republic* —The Christian republic—and even the Jewish—has only had God for ruler as Philo the Jew notices *On Monarchy*

When they fought it was for God only their chief hope was in God only they considered their towns as belonging to God only and kept them for God I Chron 19 13

612 Gen 17 7 *Statuam pactum meum inter me et te fœdere sempiterno ut sim D us tuus* [2]

Et tu ergo custodies pactum meum [3]

613 *Perpetuity* —That religion has always existed on earth which consists in believing that man has fallen from a state of glory and of communion with God into a state of sorrow penitence and estrangement from God but that after this life we shall be restored by a Messiah who should have come All things have passed away and this has endured for which all things are

Men have in the first age of the world been carried away into every kind of debauchery and yet there were saints as Enoch Lamech and others who waited patiently for the Christ promised from the beginning of the world Noah saw the wickedness of men at its height and he was held worthy to save the world in his person by the hope of the Messiah of whom he was the type Abraham was surrounded by idolaters when God made known to him the mystery of the Messiah whom he welcomed from afar In the time of Isaac and Jacob abomination was spread over all the earth but these saints lived in faith and Jacob dying and bless

[1] 20 25 *Præcepta non bona* Statutes that were not good

[2] I will establish my covenant between me and Thee for an everlasting covenant to be a God unto Thee

[3] Gen 17 9 Thou shalt keep my covenant therefore

ing his children, cried in a transport which made him break off his discourse, I await, O my God, the Saviour whom Thou hast promised *Salutare tuum expectabo, Domine* [1] The Egyptians were infected both with idolatry and magic, the very people of God were led astray by their example Yet Moses and others believed Him whom they saw not, and worshipped Him, looking to the eternal gifts which He was preparing for them

The Greeks and Latins then set up false deities, the poets made a hundred different theologies, while the philosophers separated into a thousand different sects, and yet in the heart of Judæa there were always chosen men who foretold the coming of this Messiah, which was known to them alone

He came at length in the fullness of time, and time has since witnessed the birth of so many schisms and heresies, so many political revolutions, so many changes in all things, yet this Church, which worships Him who has always been worshipped, has endured uninterruptedly It is a wonderful, incomparable, and altogether divine fact that this religion, which has always endured, has always been attacked It has been a thousand times on the eve of universal destruction and every time it has been in that state, God has restored it by extraordinary acts of His power This is astonishing, as also that it has preserved itself without yielding to the will of tyrants For it is not strange that a State endures, when its laws are sometimes made to give way to necessity, but that (See the passage indicated in Montaigne)[2]

614 States would perish if they did not often make their laws give way to necessity But religion has never suffered this, or practised it Indeed, there must be these compromises or miracles It is not strange to be saved by yieldings, and this is not strictly self-preservation, besides, in the end they perish entirely None has endured a thousand years But the fact that this religion has always maintained itself, inflexible as it is, proves its divinity

615 Whatever may be said, it must be admitted that the Christian religion has something astonishing in it Some will say, This is because you were born in it Far from it, I stiffen myself against it for this very reason for fear this prejudice bias me But, although I am born in it, I cannot help finding it so

616 *Perpetuity* —The Messiah has always been believed in The tradition from Adam was fresh in Noah and in Moses Since then the prophets have foretold him, while at the same time foretelling other things which, being from time to time fulfilled in the sight of men, showed the truth of their mission, and consequently that of their promises touching the Messiah Jesus Christ performed miracles, and the Apostles also, who converted all the heathen, and all the prophecies being thereby fulfilled, the Messiah is for ever proved

617 *Perpetuity* —Let us consider that since the beginning of the world the expectation of worship of the Messiah has existed uninterruptedly, that there have been found men who said that God had revealed to them that a Redeemer was to be born, who should save His people, that Abraham came afterwards saying that

[1] Gen 49 18 I have waited for thy salvation O Lord

[2] *Essays*, I 22

he had had a revelation that the Messiah was to spring from him by a son whom he should have that Jacob declared that of his twelve sons the Messiah would spring from Judah that Moses and the prophets then came to declare the time and the manner of His coming that they said their law was only temporary till that of the Messiah that it should endure till then but that the other should last for ever that thus either their law or that of the Messiah of which it was the promise would be always upon the earth that in fact it has always endured that at last Jesus Christ came with all the circumstances foretold This is wonderful

618 This is positive fact While all philosophers separate into different sects there is found in one corner of the world the most ancient people in it declaring that all the world is in error that God has revealed to them the truth that they will always exist on the earth In fact all other sects come to an end this one still endures and has done so for four thousand years

They declare that they hold from their ancestors that man has fallen from communion with God and is entirely estranged from God but that He has promised to redeem them that this doctrine shall always exist on the earth that their law has a double signification that during sixteen hundred years they have had people whom they believed prophets foretelling both the time and the manner that four hundred years after they were scattered everywhere because Jesus Christ was to be everywhere announced that Jesus Christ came in the manner and at the time foretold that the Jews have since been scattered abroad under a curse and nevertheless still exist

619 I see the Christian religion founded upon a preceding religion and this is what I find as a fact

I do not here speak of the miracles of Moses of Jesus Christ and of the Apostles because they do not at first seem convincing and because I only wish here to put in evidence all those foundations of the Christian religion which are beyond doubt and which cannot be called in question by any person whatsoever It is certain that we see in many places of the world a peculiar people separated from all other peoples of the world and called the Jewish people

I see then a crowd of religions in many parts of the world and in all times but their morality cannot please me nor can their proofs convince me Thus I should equally have rejected the religion of Mahomet and of China of the ancient Romans and of the Egyptians for the sole reason that none having more marks of truth than another nor anything which should necessarily persuade me reason cannot incline to one rather than the other

But in thus considering this changeable and singular variety of morals and beliefs at different times I find in one corner of the world a peculiar people separated from all other peoples on earth the most ancient of all and whose histories are earlier by many generations than the most ancient which we possess

I find then this great and numerous people sprung from a single man who worship one God and guide themselves by a law which they say that they obtained from His own hand They maintain that they are the only people in the world to whom God has revealed His mysteries that all men are corrupt and in disgrace with God that they are all abandoned to their senses and their own imagination whence come the strange errors and continual changes which happen among

them, both of religions and of morals, whereas they themselves remain firm in their conduct, but that God will not leave other nations in this darkness for ever, that there will come a Saviour for all, that they are in the world to announce Him to men, that they are expressly formed to be forerunners and heralds of this great event and to summon all nations to join with them in the expectation of this Saviour

To meet with this people is astonishing to me, and seems to me worthy of attention I look at the law which they boast of having obtained from God, and I find it admirable It is the first law of all and is of such a kind that, even before the term *law* was in currency among the Greeks, it had, for nearly a thousand years earlier, been uninterruptedly accepted and observed by the Jews I likewise think it strange that the first law of the world happens to be the most perfect, so that the greatest legislators have borrowed their laws from it, as is apparent from the law of the Twelve Tables at Athens, afterwards taken by the Romans, and as it would be easy to prove, if Josephus and others had not sufficiently dealt with this subject

620 *Advantages of the Jewish people* —In this search the Jewish people at once attracts my attention by the number of wonderful and singular facts which appear about them

I first see that they are a people wholly composed of brethren, and whereas all others are formed by the assemblage of an infinity of families, this, though so wonderfully fruitful, has all sprung from one man alone, and, being thus all one flesh, and members one of another, they constitute a powerful state of one family This is unique

This family, or people, is the most ancient within human knowledge, a fact which seems to me to inspire a peculiar veneration for it, especially in view of our present inquiry, since if God had from all time revealed Himself to men, it is to these we must turn for knowledge of the tradition

This people are not eminent solely by their antiquity, but are also singular by their duration, which has always continued from their origin till now For, whereas the nations of Greece and of Italy, of Lacedæmon, of Athens and of Rome, and others who came long after, have long since perished, these ever remain, and in spite of the endeavours of many powerful kings who have a hundred times tried to destroy them, as their historians testify, and as it is easy to conjecture from the natural order of things during so long a space of years, they have nevertheless been preserved (and this preservation has been foretold), and extending from the earliest times to the latest, their history comprehends in its duration all our histories [which it preceded by a long time]

The law by which this people is governed is at once the most ancient law in the world, the most perfect, and the only one which has been always observed without a break in a state This is what Josephus admirably proves, *Against Apion* and also Philo the Jew, in different places, where they point out that it is so ancient that the very name of *law* was only known by the oldest nation more than a thousand years afterwards, so that Homer, who has written the history of so many states, has never used the term And it is easy to judge of its perfection by simply reading it, for we see that it has provided for all things with so great wisdom, equity, and judgement, that the most ancient legislators, Greek and Roman, having had some knowledge of it, have borrowed from it their principal laws, this is evident from

what are called the Twelve Tables and from the other proofs which Josephus gives

But this law is at the same time the severest and strictest of all in respect to their religious worship imposing on this people in order to keep them to their duty a thousand peculiar and painful observances on pain of death Whence it is very astonishing that it has been constantly preserved during many centuries by a people rebellious and impatient as this one was while all other states have changed their laws from time to time although these were far more lenient

The book which contains this law the first of all is itself the most ancient book in the world those of Homer Hesiod and others being six or seven hundred years later

621 The creation of the deluge being past and God no longer requiring to destroy the world nor to create it anew nor to give such great signs of Himself He began to establish a people on the earth purposely formed who were to last until the coming of the people whom the Messiah should fashion by His spirit

622 The creation of the world beginning to be distant God provided a single contemporary historian and appointed a whole people as guardians of this book in order that this history might be the most authentic in the world and that all men might thereby learn a fact so necessary to know and which could only be known through that means

623 [Japhet begins the genealogy]
Joseph folds his arms and prefers the younger

624 Why should Moses make the lives of men so long and their generations so few?

Because it is not the length of years but the multitude of generations which renders things obscure For truth is perverted only by the change of men And yet he puts two things the most memorable that were ever imagined namely the creation and the deluge so near that we reach from one to the other

625 Shem who saw Lamech who saw Adam saw also Jacob who saw those who saw Moses therefore the deluge and the creation are true This is conclusive among certain people who understand it rightly

626 The longevity of the patriarchs instead of causing the loss of past history conduced on the contrary to its preservation For the reason why we are sometimes insufficiently instructed in the history of our ancestors is that we have never lived long with them and that they are often dead before we have attained the age of reason Now when men lived so long children lived long with their parents They conversed long with them But what else could be the subject of their talk save the history of their ancestors since to that all history was reduced and men did not study science or art which now form a large part of daily conversation? We see also that in these days tribes took particular care to preserve their genealogies

627 I believe that Joshua was the first of God s people to have this name as Jesus Christ was the last of God s people

628 *Antiquity of the Jews*—What a difference there is between one book and another[1] I am not astonished that the Greeks made the *Iliad*, nor the Egyptians and the Chinese their histories

We have only to see how this originates These fabulous historians are not contemporaneous with the facts about which they write Homer composes a romance, which he gives out as such, and which is received as such, for nobody doubted that Troy and Agamemnon no more existed than did the golden apple Accordingly, he did not think of making a history, but solely a book to amuse, he is the only writer of his time, the beauty of the work has made it last, every one learns it and talks of it, it is necessary to know it, and each one knows it by heart Four hundred years afterwards the witnesses of these facts are no longer alive, no one knows of his own knowledge if it be a fable or a history, one has only learnt it from his ancestors, and this can pass for truth

Every history which is not contemporaneous, as the books of the Sibyls and Trismegistus, and so many others which have been believed by the world, are false, and found to be false in the course of time It is not so with contemporaneous writers

There is a great difference between a book which an individual writes and publishes to a nation, and a book which itself creates a nation We cannot doubt that the book is as old as the people

629 Josephus hides the shame of his nation

Moses does not hide his own shame

Quis mihi det ut omnes prophetent?[1]

He was weary of the multitude

630 *The sincerity of the Jews*—Maccabees, after they had no more prophets, the Masorah, since Jesus Christ

This book will be a testimony for you

Defective and final letters

Sincere against their honour, and dying for it, this has no example in the world, and no root in nature

631 *Sincerity of the Jews*—They preserve lovingly and carefully the book in which Moses declares that they have been all their life ungrateful to God, and that he knows they will be still more so after his death, but that he calls heaven and earth to witness against them and that he has [*taught*] them enough

He declares that God, being angry with them, shall at last scatter them among all the nations of the earth, that as they have offended Him by worshipping gods who were not their God, so He will provoke them by calling a people who are not His people, that He desires that all His words be preserved for ever, and that His book be placed in the Ark of the Covenant to serve for ever as a witness against them

Isaiah says the same thing, 30

632 *On Esdras*—The story that the books were burnt with the temple proved false by Maccabees Jeremiah gave them the law

[1]Num 11 29 *Quis tribuat ut omnis populus prophetet* Would God that all the Lord s people were prophets

The story that he recited the whole by heart Josephus and Esdras point out *that he read the book* Baronius *Annales Ecclesiastici a Christo Nato ad Annum 1198* 180 *Nullus penitus Hebræorum antiquorum reperitur qui tradiderit libros periisse et per Esdram esse restitutos nisi in IV Esdræ*

The story that he changed the letters

Philo in *Vita Mosis Illa lingua ac character quo antiquitus scripta est lex sic permansit usque ad LXX*

Josephus says that the Law was in Hebrew when it was translated by the Seventy

Under Antiochus and Vespasian when they wanted to abolish the books and when there was no prophet they could not do so And under the Babylonians when no persecution had been made and when there were so many prophets would they have let them be burnt?

Josephus laughs at the Greeks who would not hear

Tertullian *Perinde potuit abolefactam eam violentia cataclysmi in spiritu rursus reformare quemadmodum et Hierosolymis Babylonia expugnatione deletis omne instrumentum Judaicæ literaturæ per Esdram constat restauratum* [1]

He says that Noah could as easily have restored in spirit the book of Enoch destroyed by the Deluge as Esdras could have restored the Scriptures lost during the Captivity

(Θεὸς) ἐν τῃ ἐπὶ Ναβουχοδόνοσορ αἰχμαλωσίᾳ του λαου διαφθαρεισων των Γραφων ἐνεπνευσε Εσδρᾳ τῳ ἱερει ἐκ της φυλης Λευὶ τους των προγεγονοτων προφητων παντας ἀνατάξασθαι λόγους καὶ ἀποκαταστησαι τῳ λαῳ τὴν διὰ Μωυσεως νομοθεσίαν He alleges this to prove that it is not incredible that the Seventy may have explained the Holy Scriptures with that uniformity which we admire in them And he took that from Saint Irenæus

Saint Hilary in his preface to the Psalms says that Esdras arranged the Psalms in order

The origin of this tradition comes from the 14th chapter of the fourth book of Esdras *Deus glorificatus est et Scripturæ vere divinæ creditæ sunt omnibus eandem et eisdem verbis et eisdem nominibus recitantibus ab initio usque ad finem uti et præsentes gentes cognoscerent quoniam per inspirationem Dei interpretatæ sunt Scripturæ et non esset mirabile Deum hoc in eis operatum quando in ea captivitate populi quæ facta est a Nabuchodonosor corruptis scripturis et post 70 annos Judæis descendentibus in regionem suam et post deinde temporibus Artaxerxis Persarum regis inspiravit Esdræ sacerdoti tribus Levi præteritorum prophetarum omnes rememorare sermones et restituere populo eam legem quæ data est per Moysen* [2]

[1] *De cultu feminarum* i 3 He could equally have renewed it under the Spirit s inspiration after it had been destroyed by the violence of the deluge as after the destruction of Jerusalem by the Babylonian storming of it every document of the Jewish literature is generally agreed to have been restored through Ezra

[2] Eusebius *Ecclesiastical History* V viii 14 God was glorified and the Scriptures were recognized as truly divine for they all rendered the same things in the same words and the same names from beginning to end so that even the heathen who were present knew that the Scriptures had been translated by the inspiration of God And it is no marvel that God did this for when the Scriptures had been destroyed in the captivity of the people in the days of Nebuchadnezzar and the Jews had gone back to their country after seventy years then in the times of Artaxerxes the king of the Persians he inspired Ezra the priest of the tribe of Levi to restore all the sayings of the prophets who had gone before and to restore to the people the law given by Moses This is Pascal s rendering into Latin of the passage from Eusebius of which the last lines are in Greek above

633 *Against the story in* Esdras, II Maccab 2 , Josephus, *Antiquities*, II, 1 —Cyrus took occasion from the prophecy of Isaiah to release the people The Jews held their property in peace under Cyrus in Babylon, hence they could well have the Law

Josephus, in the whole history of Esdras, does not say one word about this restoration II Kings 17 27

634 If the story in Esdras is credible, then it must be believed that the Scripture is Holy Scripture, for this story is based only on the authority of those who assert that of the Seventy, which shows that the Scripture is holy

Therefore, if this account be true, we have what we want therein, if not, we have it elsewhere And thus those who would ruin the truth of our religion, founded on Moses, establish it by the same authority by which they attack it So by this providence it still exists

635 *Chronology of Rabbinism* (The citations of pages are from the book *Pugio*)

Page 27 R Hakadosch (*anno* 200), author of the *Mischna*, or vocal law, or second law

Commentaries on the *Mischna* (*anno* 340) { The one *Siphra*
Barajetot
Talmud Hierosol
Tosiphtot

Bereschit Rabah, by R Osaiah Rabah, commentary on the *Mischna*

Bereschit Rabah, *Bar Naconi*, are subtle and pleasant discourses, historical and theological This same author wrote the books called *Rabot*

A hundred years after the *Talmud Hierosol* was composed the *Babylonian Talmud*, by R Ase, A D 440, by the universal consent of all the Jews who are necessarily obliged to observe all that is contained therein

The addition of R Ase is called the *Gemara*, that is to say, the *commentary* on the *Mischna*

And the Talmud includes together the *Mischna* and the *Gemara*

636 *If* does not indicate indifference Malachi, Isaiah

Isaiah, *Si volumus*, etc

In quacumque die [1]

637 *Prophecies* —The sceptre was not interrupted by the captivity in Babylon, because the return was promised and foretold

638 *Proofs of Jesus Christ* —Captivity, with the assurance of deliverance within seventy years, was not real captivity But now they are captives without any hope

God has promised them that, even though He should scatter them to the ends of the earth, nevertheless if they were faithful to His law, He would assemble them together again They are very faithful to it and remain oppressed

639 When Nebuchadnezzar carried away the people, for fear they should believe that the sceptre had departed from Judah, they were told beforehand that

[1] Each time that

they would be there for a short time and that they would be restored They were always consoled by the prophets and their kings continued But the second destruction is without promise of restoration without prophets without kings without consolation without hope because the sceptre is taken away for ever

640 It is a wonderful thing and worthy of particular attention to see this Jewish people existing so many years in perpetual misery it being necessary as a proof of Jesus Christ both that they should exist to prove Him and that they should be miserable because they crucified Him and though to be miserable and to exist are contradictory they nevertheless still exist in spite of their misery

641 They are visibly a people expressly created to serve as a witness to the Messiah (Isaiah 43 9 44 8) They keep the books and love them and do not understand them And all this was foretold that God s judgments are entrusted to them but as a sealed book

SECTION X

TYPOLOGY

642 *Proof of the two Testaments at once* —To prove the two at one stroke we need only see if the prophecies in one are fulfilled in the other To examine the prophecies we must understand them For if we believe they have only one meaning it is certain that the Messiah has not come but if they have two meanings it is certain that He has come in Jesus Christ

The whole problem then is to know if they have two meanings

That the Scripture has two meanings which Jesus Christ and the Apostles have given is shown by the following proofs

1 Proof by Scripture itself

2 Proof by the Rabbis Moses Maimonides says that it has two aspects and that the prophets have prophesied Jesu Christ only

3 Proof by the Kabbala

4 Proof by the mystical interpretation which the Rabbis themselves give to Scripture

5 Proof by the principles of the Rabbis that there are two meanings that there are two advents of the Messiah a glorious and an humiliating one according to their desert that the prophets have prophesied of the Messiah only—the Law is not eternal but must change at the coming of the Messiah—that then they shall no more remember the Red Sea that the Jews and the Gentiles shall be mingled

[6 Proof by the key which Jesus Christ and the Apostles give us]

643 Isaiah 51 The Red Sea an image of the Redemption *Ut sciatis quod filius hominis habet potestatem remittendi peccata* ... *tibi dico Surge*[1] God wishing to show that He could form a people holy with an invisible holiness and fill them with an

[1]*Mark 2 10 11* *But that ye may know that the son of man hath power on earth to forgive sins* ... *I say unto thee Arise*

eternal glory, made visible things As nature is an image of grace, He has done in the bounties of nature what He would do in those of grace, in order that we might judge that He could make the invisible, since He made the visible excellently

Therefore He saved this people from the deluge, He has raised them up from Abraham, redeemed them from their enemies, and set them at rest

The object of God was not to save them from the deluge, and raise up a whole people from Abraham, only in order to bring them into a rich land

And even grace is only the type of glory, for it is not the ultimate end It has been symbolised by the law, and itself symbolises [*glory*] But it is the type of it, and the origin or cause

The ordinary life of men is like that of the saints They all seek their satisfaction and differ only in the object in which they place it, they call those their enemies who hinder them, etc God has then shown the power which He has of giving invisible blessings, by that which He has shown Himself to have over things visible

644 *Types* —God, wishing to form for Himself an holy people, whom He should separate from all other nations, whom He should deliver from their enemies and should put into a place of rest, has promised to do so and has foretold by His prophets the time and the manner of His coming And yet, to confirm the hope of His elect, He has made them see in it an image through all time, without leaving them devoid of assurances of His power and of His will to save them For, at the creation of man, Adam was the witness, and guardian of the promise of a Saviour, who should be born of woman, when men were still so near the creation that they could not have forgotten their creation and their fall When those who had seen Adam were no longer in the world, God sent Noah whom He saved, and drowned the whole earth by a miracle which sufficiently indicated the power which He had to save the world, and the will which He had to do so, and to raise up from the seed of woman Him whom He had promised This miracle was enough to confirm the hope of men

The memory of the Deluge being so fresh among men, while Noah was still alive, God made promises to Abraham, and, while Shem was still living, sent Moses, etc

645 *Types* —God, willing to deprive His own of perishable blessings, created the Jewish people in order to show that this was not owing to lack of power

646 The Synagogue did not perish, because it was a type But, because it was only a type, it fell into servitude The type existed till the truth came, in order that the Church should be always visible, either in the sign which promised it, or in substance

647 That the law was figurative

648 Two errors 1 To take everything literally 2 To take everything spiritually

649 To speak against too greatly figurative language

650 There are some types clear and demonstrative but others which seem some

what far fetched and which convince only those who are already persuaded These are like the Apocalyptics But the difference is that they have none which are certain so that nothing is so unjust as to claim that theirs are as well founded as some of ours for they have none so demonstrative as some of ours The comparison is unfair We must not put on the same level and confound things because they seem to agree in one point while they are so different in another The clearness in divine things requires us to revere the obscurities in them

[It is like men who employ a certain obscure language among themselves Those who should not understand it would understand only a foolish meaning]

651 *Extravagances of the Apocalyptics Preadamites Millenarians etc* —He who would base extravagant opinions on Scripture will for example base them on this It is said that this generation shall not pass till all these things be fulfilled Upon that I will say that after that generation will come another generation and so on ever in succession

Solomon and the King are spoken of in the second book of Chronicles as if they were two different persons I will say that they were two

652 *Particular Types* —A double law double tables of the law a double temple a double captivity

653 *Types* —The prophets prophesied by symbols of a girdle a beard and burnt hair etc.

654 Difference between dinner and supper

In God the word does not differ from the intention for He is true nor the word from the effect for He is powerful nor the means from the effect for He is wise St Bernard *Ultimo Sermo in Missam*

St Augustine *City of God* v 10 This rule is general God can do every thing except those things which if He could do He would not be almighty as dying being deceived lying etc

Several Evangelists for the confirmation of the truth their difference useful

The Eucharist after Lord s Supper Truth after the type

The ruin of Jerusalem a type of the ruin of the world forty years after the death of Jesus I know not as a man or as an ambassador (Mark 13 32 Matthew 24 36)

Jesus condemned by the Jews and the Gentiles

The Jews and the Gentiles typified by the two sons St Augustine *City of God* xx 29

655 The six ages the six Fathers of the six ages the six wonders at the beginning of the six ages the six mornings at the beginning of the six ages

656 Adam *forma futuri* [1] The six days to form the one the six ages to form the other The six days which Moses represents for the formation of Adam are only the picture of the six ages to form Jesus Christ and the Church If Adam had not sinned and Jesus Christ had not come there had been only one covenant only

[1]Rom 5 14 The figure of him that was to come

one age of men, and the creation would have been represented as accomplished at one single time

657 *Types*—The Jewish and Egyptian peoples were plainly foretold by the two individuals whom Moses met, the Egyptian beating the Jew, Moses avenging him and killing the Egyptian, and the Jew being ungrateful

658 The symbols of the Gospel for the state of the sick soul are sick bodies, but, because one body cannot be sick enough to express it well, several have been needed Thus there are the deaf, the dumb, the blind, the paralytic, the dead Lazarus, the possessed All this crowd is in the sick soul

659 *Types*—To show that the Old Testament is only figurative and that the prophets understood by temporal blessings other blessings, this is the proof

First, that this would be unworthy of God

Secondly, that their discourses express very clearly the promise of temporal blessings, and that they say nevertheless that their discourses are obscure, and that their meaning will not be understood Whence it appears that this secret meaning was not that which they openly expressed, and that consequently they meant to speak of other sacrifices, of another deliverer, etc They say that they will be understood only in the fullness of time (Jer 30 24)

The third proof is that their discourses are contradictory, and neutralise each other, so that, if we think that they did not mean by the words *law* and *sacrifice* anything else than that of Moses, there is a plain and gross contradiction Therefore they meant something else, sometimes contradicting themselves in the same chapter Now, to understand the meaning of an author

660 Lust has become natural to us and has made our second nature Thus there are two natures in us—the one good, the other bad Where is God? Where you are not, and the kingdom of God is within you The Rabbis

661 Penitence, alone of all these mysteries, has been manifestly declared to the Jews, and by Saint John, the Forerunner, and then the other mysteries, to indicate that in each man, as in the entire world, this order must be observed

662 The carnal Jews understood neither the greatness nor the humiliation of the Messiah foretold in their prophecies They misunderstood Him in His foretold greatness, as when He said that the Messiah should be lord of David, though his son, and that He was before Abraham, who had seen Him They did not believe Him so great as to be eternal, and they likewise misunderstood Him in His humiliation and in His death The Messiah, said they, abideth for ever, and this man says that he shall die ' Therefore they believed Him neither mortal nor eternal, they only sought in Him for a carnal greatness

663 *Typical*—Nothing is so like charity as covetousness and nothing is so opposed to it Thus the Jews full of possessions which flattered their covetousness, were very like Christians and very contrary And by this means they had the two qualities which it was necessary they should have, to be very like

the Messiah to typify Him and very contrary not to be suspected witnesses

664 *Typical*—God made use of the lust of the Jews to make them minister to Jesus Christ [who brought the remedy for their lust]

665 Charity is not a figurative precept It is dreadful to say that Jesus Christ who came to take away types in order to establish the truth came only to establish the type of charity in order to take away the existing reality which was there before

If the light be darkness how great is that darkness[1]

666 Fascination *Somnum suum*[1] *Figura hujus mundi*[2]

The Eucharist *Comedes panem tuum*[3] *Panem nostrum*[4]

Inimici Dei terram lingent[5] Sinners lick the dust that is to say love earthly pleasures

The Old Testament contains the types of future joy and the New contains the means of arriving at it The types were of joy the means of penitence and nevertheless the Paschal Lamb was eaten with bitter herbs *cum amaritudinibus*[6]

Singularis sum ego donec transeam[7] Jesus Christ before His death was almost the only martyr

667 *Typical*—The expressions *sword shield Potentissime*[8]

668 We are estranged only by departing from charity Our prayers and our virtues are abominable before God if they are not the prayers and the virtues of Jesus Christ And our sins will never be the object of [*mercy*] but of the justice of God if they are not [*those of*] Jesus Christ He has adopted our sins and has [*admitted*] us into union [*with Him*] for virtues are [*His own and*] sins are foreign to Him while virtues [*are*] foreign to us and our sins are our own

Let us change the rule which we have hitherto chosen for judging what is good We had our own will as our rule Let us now take the will of [*God*] all that He wills is good and right to us all that He does not will is [*bad*]

All that God does not permit is forbidden Sins are forbidden by the general declaration that God has made that He did not allow them Other things which He has left without general prohibition and which for that reason are said to be permitted are nevertheless not always permitted For when God removed some one of them from us and when by the event which is a manifestation of the will of God it appears that God does not will that we should have a thing that is then forbidden to us as sin since the will of God is that we should not have one more than another There is this sole difference between these two things that it is certain that God will never allow sin while it is not certain that He will never allow

[1]Ps 75 5 They have slept their sleep
[2]I Cor 7 31 The fashion of this world
[3]Deut 8 9 Bread without scarceness
[4]Luke 11 3 Our daily bread
[5]Ps 71 9 The enemies of the Lord shall lick the dust
[6]Exod 12 8 *Cum lactucibus agrestibus* With bitter herbs
[7]Ps 140 10 Whilst that I withal escape
[8]Ps 44 4 O most mighty

the other But so long as God does not permit it, we ought to regard it as sin, so long as the absence of God s will, which alone is all goodness and all justice, renders it unjust and wrong

669 To change the type, because of our weakness

670 *Types* —The Jews had grown old in these earthly thoughts, that God loved their father Abraham, his flesh and what sprung from it, that on account of this He had multiplied them and distinguished them from all other nations, without allowing them to intermingle, that, when they were languishing in Egypt, He brought them out with all these great signs in their favour, that He fed them with manna in the desert, and led them into a very rich land, that He gave them kings and a well built temple, in order to offer up beasts before Him, by the shedding of whose blood they should be purified, and that, at last, He was to send them the Messiah to make them masters of all the world, and foretold the time of His coming

The world having grown old in these carnal errors, Jesus Christ came at the time foretold, but not with the expected glory, and thus men did not think it was He After His death, Saint Paul came to teach men that all these things had happened in allegory, that the kingdom of God did not consist in the flesh, but in the spirit, that the enemies of men were not the Babylonians, but the passions, that God delighted not in temples made with hands, but in a pure and contrite heart, that the circumcision of the body was unprofitable, but that of the heart was needed, that Moses had not given them the bread from heaven, etc

But God, not having desired to reveal these things to this people who were unworthy of them and having, nevertheless, desired to foretell them, in order that they might be believed, foretold the time clearly, and expressed the things sometimes clearly, but very often in figures, in order that those who loved symbols might consider them and those who loved what was symbolised might see it therein

All that tends not to charity is figurative

The sole aim of the Scripture is charity

All which tends not to the sole end is the type of it For since there is only one end, all which does not lead to it in express terms is figurative

God thus varies that sole precept of charity to satisfy our curiosity which seeks for variety, by that variety which still leads us to the one thing needful For one thing alone is needful, and we love variety, and God satisfies both by these varieties, which lead to the one thing needful

The Jews have so much loved the shadows and have so strictly expected them that they have misunderstood the reality, when it came in the time and manner foretold

The Rabbis take the breasts of the Spouse for types and all that does not express the only end they have, namely, temporal good

And Christians take even the Eucharist as a type of the glory at which they aim

671 The Jews, who have been called to subdue nations and kings, have been the slaves of sin, and the Christians, whose calling has been to be servants and subjects, are free children

672 *A formal point* —When Saint Peter and the Apostles deliberated about abolishing circumcision where it was a question of acting against the law of God they did not heed the prophets but simply the reception of the Holy Spirit in the persons uncircumcised

They thought it more certain that God approved of those whom He filled with His Spirit than it was that the law must be obeyed They knew that the end of the law was only the Holy Spirit and that thus as men certainly had this without circumcision it was not necessary

673 *Fac secundum exemplar quod tibi ostensum est in monte* [1]—The Jewish religion then has been formed on its likeness to the truth of the Messiah and the truth of the Messiah has been recognised by the Jewish religion which was the type of it

Among the Jews the truth was only typified in heaven it is revealed

In the Church it is hidden and recognised by its resemblance to the type

The type has been made according to the truth and the truth has been recognised according to the type

Saint Paul says himself that people will forbid to marry and he himself speaks of it to the Corinthians in a way which is a snare For if a prophet had said the one and Saint Paul had then said the other he would have been accused

674 *Typical* — Do all things according to the pattern which has been shown thee on the mount On which Saint Paul says that the Jews have shadowed forth heavenly things

675 And yet this Covenant made to blind some and enlighten others indicated in those very persons whom it blinded the truth which should be recognised by others For the visible blessings which they received from God were so great and so divine that He indeed appeared able to give them those that are invisible and a Messiah

For nature is an image of Grace and visible miracles are images of the invisible *Ut sciatis tibi dico Surge* [2]

Isaiah says that Redemption will be as the passage of the Red Sea

God has then shown by the deliverance from Egypt and from the sea by the defeat of kings by the manna by the whole genealogy of Abraham that He was able to save to send down bread from heaven etc so that the people hostile to Him are the type and the representation of the very Messiah whom they know not etc

He has then taught us at last that all these things were only types and what is true freedom a true Israelite true circumcision true bread from heaven etc

In these promises each one finds what he has most at heart temporal benefits or spiritual God or the creatures but with this difference that those who therein seek the creatures find them but with many contradictions with a prohibition against loving them with the command to worship God only and to love Him only which is the same thing and finally that the Messiah came not for them whereas those who therein seek God find Him without any contradiction with

[1] Exod 25 40 Make them after their pattern which was showed thee on the mount
[2] Mark 2 10 11 That ye may know I say unto thee Arise

the command to love Him only, and that the Messiah came in the time foretold, to give them the blessings which they ask

Thus the Jews had miracles and prophecies, which they saw fulfilled, and the teaching of their law was to worship and love God only, it was also perpetual Thus it had all the marks of the true religion, and so it was But the Jewish teaching must be distinguished from the teaching of the Jewish law Now the Jewish teaching was not true, although it had miracles and prophecy and perpetuity, because it had not this other point of worshipping and loving God only

676 The veil, which is upon these books for the Jews, is there also for evil Christians and for all who do not hate themselves

But how well disposed men are to understand them and to know Jesus Christ, when they truly hate themselves!

677 A type conveys absence and presence, pleasure and pain

A cipher has a double meaning, one clear and one in which it is said that the meaning is hidden

678 *Types* —A portrait conveys absence and presence, pleasure and pain The reality excludes absence and pain

To know if the law and the sacrifices are a reality or a type, we must see if the prophets, in speaking of these things, confined their view and their thought to them, so that they saw only the old covenant, or if they saw therein something else of which they were the representation, for in a portrait we see the thing figured For this we need only examine what they say of them

When they say that it will be eternal, do they mean to speak of that covenant which they say will be changed, and so of the sacrifices, etc ?

A cipher has two meanings When we find out an important letter in which we discover a clear meaning, and in which it is nevertheless said that the meaning is veiled and obscure, that it is hidden, so that we might read the letter without seeing it, and interpret it without understanding it, what must we think but that here is a cipher with a double meaning, and the more so if we find obvious contradictions in the literal meaning? The prophets have clearly said that Israel would be always loved by God and that the law would be eternal, and they have said that their meaning would not be understood and that it was veiled

How greatly, then, ought we to value those who interpret the cipher and teach us to understand the hidden meaning, especially if the principles which they educe are perfectly clear and natural! This is what Jesus Christ did and the Apostles They broke the seal, He rent the veil, and revealed the spirit They have taught us through this that the enemies of man are his passions, that the Redeemer would be spiritual, and His reign spiritual, that there would be two advents, one in lowliness to humble the proud, the other in glory to exalt the humble, that Jesus Christ would be both God and man

679 *Types* —Jesus Christ opened their mind to understand the Scriptures

Two great revelations are these (1) All things happened to them in types *vere Israëlitæ, vere liberi*,[1] true bread from Heaven (2) A God humbled to the Cross It

[1]See note to 564

was necessary that Christ should suffer in order to enter into glory that He should destroy death through death Two advents

680 *Types* —When once this secret is disclosed it is impossible not to see it Let us read the Old Testament in this light and let us see if the sacrifices were real if the fatherhood of Abraham was the true cause of the friendship of God and if the promised land was the true place of rest No They are therefore types Let us in the same way examine all those ordained ceremonies all those commandments which are not of charity and we shall see that they are types

All these sacrifices and ceremonies were then either types or nonsense Now these are things too clear and too lofty to be thought nonsense

To know if the prophets confined their view in the Old Testament or saw therein other things

681 *Typical* —The key of the cipher *Veri adoratores*[1] *Ecce agnus Dei qui tollit peccata mundi*[2]

682 Is 1 21 Change of good into evil and the vengeance of God Is 10 1 26 20 28 1 Miracles Is 33 9 40 17 41 26 43 13

Jer 11 21 15 12 17 9 *Pravum est cor omnium et incrustabile quis cognoscet illud?*[3] that is to say Who can know all its evil? For it is already known to be wicked *Ego dominus*[4] etc —vii 14 *Faciam domui huic*[5] etc Trust in external sacrifices—7 22 *Quia non sum locutus*[6] etc Outward sacrifice is not the essential point—11 13 *Secundum numerum*[7] etc A multitude of doctrines

Is 44 20–24 54 8 63 12–17 66 17 Jer 2 35 4 22–24 5 4 29–31 6 16 22 15–17

683 *Types* —The letter kills All happened in types Here is the cipher which Saint Paul gives us Christ must suffer An humiliated God Circumcision of the heart true fasting true sacrifice a true temple The prophets have shown that all these must be spiritual

Not the meat which perishes but that which does not perish

Ye shall be free indeed Then the other freedom was only a type of freedom

I am the true bread from Heaven

684 *Contradiction* —We can only describe a good character by reconciling all contrary qualities and it is not enough to keep up a series of harmonious qualities without reconciling contradictory ones To understand the meaning of an author we must make all the contrary passages agree

Thus to understand Scripture we must have a meaning in which all the contrary passages are reconciled It is not enough to have one which suits many con

[1] John 4 23 True worshippers
[2] John 1 29 Behold the Lamb of God which taketh away the sin of the world
[3] The heart is deceitful above all things and desperately wicked who can know it?
[4] Is 44 24 I am the Lord
[5] I will do unto this house
[6] For I spoke not unto your fathers
[7] According to the number

curring passages, but it is necessary to have one which reconciles even contradictory passages

Every author has a meaning in which all the contradictory passages agree, or he has no meaning at all We cannot affirm the latter of Scripture and the prophets, they undoubtedly are full of good sense We must, then, seek for a meaning which reconciles all discrepancies

The true meaning, then, is not that of the Jews, but in Jesus Christ all the contradictions are reconciled

The Jews could not reconcile the cessation of the royalty and principality, foretold by Hosea, with the prophecy of Jacob

If we take the law, the sacrifices, and the kingdom as realities, we cannot reconcile all the passages They must then necessarily be only types We cannot even reconcile the passages of the same author, nor of the same book, nor sometimes of the same chapter, which indicates copiously what was the meaning of the author As when Ezekiel, chap 20, says that man will not live by the commandments of God and will live by them

685 *Types* —If the law and the sacrifices are the truth, it must please God, and must not displease Him If they are types, they must be both pleasing and displeasing

Now in all the Scripture they are both pleasing and displeasing It is said that the law shall be changed, that the sacrifice shall be changed, that they shall be without law, without a prince, and without a sacrifice, that a new covenant shall be made, that the law shall be renewed, that the precepts which they have received are not good, that their sacrifices are abominable, that God has demanded none of them

It is said, on the contrary, that the law shall abide for ever, that this covenant shall be for ever, that sacrifice shall be eternal, that the sceptre shall never depart from among them, because it shall not depart from them till the eternal King comes

Do all these passages indicate what is real? No Do they then indicate what is typical? No, but what is either real or typical But the first passages, excluding as they do reality, indicate that all this is only typical

All these passages together cannot be applied to reality, all can be said to be typical, therefore they are not spoken of reality, but of the type

Agnus occisus est ab origine mundi [1] A sacrificing judge

686 *Contradictions* —The sceptre till the Messiah—without king or prince
The eternal law—changed
The eternal covenant—a new covenant
Good laws—bad precepts Ezekiel

687 *Types* —When the word of God, which is really true, is false literally, it is true spiritually *Sede a dextris meis* [2] this is false literally, therefore it is true spiritually

In these expressions, God is spoken of after the manner of men, and this means nothing else but that the intention which men have in giving a seat at their right

[1]Rev 13 8 The Lambs slain from the foundation of the world
[2]Ps 109 1 Sit thou at my right hand

hand God will have also It is then an indication of the intention of God not of His manner of carrying it out

Thus when it is said God has received the odour of your incense and will in recompense give you a rich land that is equivalent to saying that the same intention which a man would have who pleased with your perfumes should in recompense give you a rich land God will have towards you because you have had the same intention as a man has towards him to whom he presents perfumes So *iratus est* a jealous God etc For the things of God being inexpressible they cannot be spoken of otherwise and the Church makes use of them even to day *Quia confortavit seras* [1] etc

It is not allowable to attribute to Scripture the meaning which is not revealed to us that it has Thus to say that the closed *mem* of Isaiah signifies six hundred has not been revealed It might be said that the final *tsade* and *he deficientes* may signify mysteries But it is not allowable to say so and still less to say this is the way of the philosopher s stone But we say that the literal meaning is not the true meaning because the prophets have themselves said so

688 I do not say that the *mem* is mystical

689 Moses (Deut 30) promises that God will circumcise their heart to render them capable of loving Him

690 One saying of David or of Moses as for instance that God will circumcise the heart enables us to judge of their spirit If all their other expressions were ambiguous and left us in doubt whether they were philosophers or Christians one saying of this kind would in fact determine all the rest as one sentence of Epictetus decides the meaning of all the rest to be the opposite So far ambiguity exists but not afterwards

691 If one of two persons who are telling silly stories uses language with a double meaning understood in his own circle while the other uses it with only one meaning any one not in the secret who hears them both talk in this manner will pass upon them the same judgment But if afterwards in the rest of their conversation one says angelic things and the other always dull commonplaces he will judge that the one spoke in mysteries and not the other the one having sufficiently shown that he is incapable of such foolishness and capable of being mysterious and the other that he is incapable of mystery and capable of foolishness

The Old Testament is a cipher

692 There are some that see clearly that man has no other enemy than lust which turns him from God and not God and that he has no other good than God and not a rich land Let those who believe that the good of man is in the flesh and evil in what turns him away from sensual pleasures [*satiate*] themselves with them and [*die*] in them But let those who seek God with all their heart who are only troubled at not seeing Him who desire only to possess Him and have as enemies only those who turn them away from Him who are grieved at seeing themselves surrounded and overwhelmed with such enemies take comfort I pro

[1] Ps 147 13 *Quoniam* not *quia* For he hath strengthened the bars

claim to them happy news There exists a Redeemer for them I shall show Him to them I shall show that there is a God for them I shall not show Him to others I shall make them see that a Messiah has been promised, who should deliver them from their enemies, and that One has come to free them from their iniquities, but not from their enemies

When David foretold that the Messiah would deliver His people from their enemies, one can believe that in the flesh these would be the Egyptians, and then I cannot show that the prophecy was fulfilled But one can well believe also that the enemies would be their sins, for indeed the Egyptians were not their enemies, but their sins were so This word *enemies* is, therefore, ambiguous But if he says elsewhere, as he does, that He will deliver His people from their sins, as indeed do Isaiah and others, the ambiguity is removed, and the double meaning of enemies is reduced to the simple meaning of iniquities For if he had *sins* in his mind, he could well denote them as *enemies*, but if he thought of *enemies*, he could not designate them as *iniquities*

Now Moses, David, and Isaiah used the same terms Who will say, then, that they have not the same meaning and that David s meaning, which is plainly *iniquities* when he spoke of *enemies*, was not the same as [*that of*] Moses when speaking of *enemies*?

Daniel (ix) prays for the deliverance of the people from the captivity of their enemies But he was thinking of *sins*, and, to show this, he says that Gabriel came to tell him that his prayer was heard, and that there were only seventy weeks to wait, after which the people would be freed from iniquity, sin would have an end, and the Redeemer, the Holy of Holies, would bring *eternal* justice, not legal, but eternal.

SECTION XI

THE PROPHECIES

693 When I see the blindness and the wretchedness of man, when I regard the whole silent universe and man without light, left to himself and, as it were, lost in this corner of the universe, without knowing who has put him there, what he has come to do, what will become of him at death, and incapable of all knowledge, I become terrified, like a man who should be carried in his sleep to a dreadful desert island and should awake without knowing where he is and without means of escape And thereupon I wonder how people in a condition so wretched do not fall into despair I see other persons around me of a like nature I ask them if they are better informed than I am They tell me that they are not And thereupon these wretched and lost beings, having looked around them and seen some pleasing objects, have given and attached themselves to them For my own part I have not been able to attach myself to them, and, considering how strongly it appears that there is something else than what I see, I have examined whether this God has not left some sign of Himself

I see many contradictory religions, and consequently all false save one Each wants to be believed on its own authority, and threatens unbelievers I do not therefore believe them Every one can say this every one can call himself a prophet

But I see that Christian religion wherein prophecies are fulfilled and that is what every one cannot do

694 And what crowns all this is prediction so that it should not be said that it is chance which has done it?

Whosoever having only a week to live, will not find out that it is expedient to believe that all this is not a stroke of chance

Now if the passions had no hold on us a week and a hundred years would amount to the same thing

695 *Prophecies* —Great Pan is dead

696 *Susceperunt verbum cum omni aviditate scrutantes Scripturas si ita se haberent* [1]

697 *Prodita lege Impleta cerne Implenda collige* [2]

698 We understand the prophecies only when we see the events happen Thus the proofs of retreat discretion silence etc are proofs only to those who know and believe them

Joseph so internal in a law so external

Outward penances dispose to inward as humiliations to humility Thus the

699 The synagogue has preceded the church the Jews the Christians The prophets have foretold the Christians Saint John Jesus Christ

700 It is glorious to see with the eyes of faith the history of Herod and of Cæsar

701 The zeal of the Jews for their law and their temple (Josephus and Philo the Jew *Ad Caium*) What other people had such a zeal? It was necessary they should have it

Jesus Christ foretold as to the time and the state of the world The ruler taken from the thigh and the fourth monarchy How lucky we are to see this light amidst this darkness!

How fine it is to see with the eyes of faith Darius and Cyrus Alexander the Romans Pompey and Herod working without knowing it for the glory of the Gospel!

702 Zeal of the Jewish people for the law especially after there were no more prophets

703 While the prophets were for maintaining the law the people were indifferent But since there have been no more prophets zeal has succeeded them

[1] Acts 17 11 They received the word with all readiness of mind and searched the Scriptures daily whether those things were so

[2] Read what has been announced See what has been accomplished Meditate on what is to be done

704 The devil troubled the zeal of the Jews before Jesus Christ, because he would have been their salvation, but not since

The Jewish people scorned by the Gentiles, the Christian people persecuted

705 *Proof*—Prophecies with their fulfilment, what has preceded and what has followed Jesus Christ

706 The prophecies are the strongest proof of Jesus Christ It is for them also that God has made most provision, for the event which has fulfilled them is a miracle existing since the birth of the Church to the end So God has raised up prophets during sixteen hundred years, and, during four hundred years afterwards, He has scattered all these prophecies among all the Jews, who carried them into all parts of the world Such was the preparation for the birth of Jesus Christ, and, as His Gospel was to be believed by all the world, it was not only necessary that there should be prophecies to make it believed, but that these prophecies should exist throughout the whole world, in order to make it embraced by the whole world

707 But it was not enough that the prophecies should exist It was necessary that they should be distributed throughout all places and preserved throughout all times And, in order that this agreement might not be taken for an effect of chance, it was necessary *that this should be foretold*

It is far more glorious for the Messiah that the Jews should be the spectators and even the instruments of His glory, besides that God had reserved them

708 *Prophecies*—*The time foretold by the state of the Jewish people, by the* state of the heathen, by the state of the temple, by the number of years

709 One must be bold to predict the same thing in so many ways It was necessary *that the four idolatrous or pagan monarchies, the end of the kingdom of* Judah, and the seventy weeks, should happen at the same time, and all this before the second temple was destroyed

710 *Prophecies*—*If one man alone had made a book of predictions* about Jesus Christ, as to the time and the manner, and Jesus Christ had come in conformity to these prophecies, this fact would have infinite weight

But there is much more here Here is a succession of men during four thousand years, who, *consequently* and without variation, come, one after another to foretell this same event Here is a whole people who announce it and who have existed for four thousand years, in order to give corporate testimony of the assurances which they have and from which they cannot be diverted by whatever threats and *persecutions people may make* against them This is far more important

711 *Predictions of particular things*—They were strangers in Egypt, without any private property, either in that country or elsewhere [There was not the least appearance, either of the royalty which had previously existed so long or of that supreme council of seventy judges which they called the *Sanhedrin* and which having been instituted by Moses lasted to the time of Jesus Christ All these things were as far removed from their state at that time as they could be] when Jacob,

dying and blessing his twelve children declared to them that they would be proprietors of a great land and foretold in particular to the family of Judah that the kings who would one day rule them should be of his race and that all his brethren should be their subjects [and that even the Messiah who was to be the expectation of nations should spring from him and that the kingship should not be taken away from Judah nor the ruler and law giver of his descendants till the expected Messiah should arrive in his family]

This same Jacob disposing of this future land as though he had been its ruler gave a portion to Joseph more than to the others I give you said he one part more than to your brothers And blessing his two children Ephraim and Manasseh whom Joseph had presented to him the elder Manasseh on his right and the young Ephraim on his left he put his arms crosswise and placing his right hand on the head of Ephraim and his left on Manasseh he blessed them in this manner And upon Joseph s representing to him that he was preferring the younger he replied to him with admirable resolution I know it well my son but Ephraim will increase more than Manasseh This has been indeed so true in the result that being alone almost as fruitful as the two entire lines which composed a whole kingdom they have been usually called by the name of Ephraim alone

This same Joseph when dying bade his children carry his bones with them when they should go into that land to which they only came two hundred years afterwards

Moses who wrote all these things so long before they happened himself assigned to each family portions of that land before they entered it as though he had been its ruler [In fact he declared that God was to raise up from their nation and their race a prophet of whom he was the type and he foretold them exactly all that was to happen to them in the land which they were to enter after his death the victories which God would give them their ingratitude towards God the punishments which they would receive for it and the rest of their adventures] He gave them judges who should make the division He prescribed the entire form of political government which they should observe the cities of refuge which they should build and

712 The prophecies about particular things are mingled with those about the Messiah so that the prophecies of the Messiah should not be without proofs nor the special prophecies without fruit

713 *Perpetual captivity of the Jews* —Jer 11 11 I will bring evil upon Judah from which they shall not be able to escape

Types —Is 5 The Lord had a vineyard from which He looked for grapes and it brought forth only wild grapes I will therefore lay it waste and destroy it the earth shall only bring forth thorns and I will forbid the clouds from [*raining*] upon it The vineyard of the Lord is the house of Israel and the men of Judah His pleasant plant I looked that they should do justice and they bring forth only iniquities

Is 8 Sanctify the Lord with fear and trembling let Him be your only dread and He shall be to you for a sanctuary but for a stone of stumbling and a rock of offence to both the houses of Israel for a gin and for a snare to the inhabi

tants of Jerusalem, and many among them shall stumble against that stone, and fall, and be broken, and be snared, and perish Hide my words, and cover my law for my disciples

I will then wait in patience upon the Lord that hideth and concealeth Himself from the house of Jacob '

Is 29 Be amazed and wonder, people of Israel, stagger and stumble, and be drunken, but not with wine, stagger, but not with strong drink For the Lord hath poured out upon you the spirit of deep sleep He will close your eyes, He will cover your princes and your prophets that have visions (Daniel xii The wicked shall not understand, but the wise shall understand Hosea, the last chapter, the last verse, after many temporal blessings, says Who is wise, and he shall understand these things? etc) ' And the visions of all the prophets are become unto you as a sealed book, which men deliver to one that is learned, and who can read, and he saith, I cannot read it, for it is sealed And when the book is delivered to them that are not learned, they say, I am not learned

Wherefore the Lord said, Forasmuch as this people with their lips do honour me, but have *removed their heart far from me, —there is the reason and the cause* of it, for if they adored God in their hearts, they would understand the prophecies, — and their fear towards me is taught by the precept of man Therefore, behold, I will *proceed to do a marvellous work among this people,* even *a marvellous* work and a wonder, for the wisdom of their wise men shall perish, and their understanding shall be [*hid*]

Prophecies Proofs of Divinity —Is 41 'Shew the things that are to come hereafter, that we may know that ye are gods we will incline our heart unto your words Teach us the things that have been at the beginning, and declare us things for to come

By this we shall know that ye are gods Yea, do good or do evil, if you can Let us then behold it and reason together Behold, ye are of nothing, and only an abomination, etc Who, ' (among contemporary writers), hath declared from the beginning that we may know of the things done from the beginning and origin? that we may say, You are righteous There is none that teacheth us, yea, there is none that declareth the future

Is 42 I am the Lord, and my glory will I not give to another I have foretold the things which have come to pass, and things that are to come do I declare Sing unto God a new song in all the earth

Bring forth the blind people that *have eyes and see not, and the deaf that have* ears and hear not Let all the nations be gathered together Who among them can declare this, and shew us former things, and things to come? Let them bring *forth their witnesses, that they may be justified,* or let them hear, and say, It is truth

' Ye are my witnesses, saith the Lord and my servant whom I have chosen, that ye may know and believe me, and understand that I am He

I have declared, and have saved, and I alone have done wonders before your eyes ye are my witnesses, said the Lord, that I am God

For your sake I have brought down the forces of the Babylonians I am the Lord, your Holy One and Creator

I have made a way in the sea, and a path in the mighty waters I am He that drowned and destroyed for ever the mighty enemies that have resisted you

Remember ye not the former things neither consider the things of old

Behold I will do a new thing now it shall spring forth shall ye not know it? I will even make a way in the wilderness and rivers in the desert

This people have I formed for myself I have established them to shew forth my praise etc

I even I am He that blotteth out thy transgressions for mine own sake and will not remember thy sins Put in remembrance your ingratitude see thou if thou mayest be justified Thy first father hath sinned and thy teachers have transgressed against me

Is 44 I am the first and I am the last saith the Lord Let him who will equal himself to me declare the order of things since I appointed the ancient people and the things that are coming Fear ye not have I not told you all these things? Ye are my witnesses

Prophecy of Cyrus —Is 45 4 For Jacob s sake mine elect I have called thee by thy name

Is 45 21 Come and let us reason together Who hath declared this from ancient time? Who hath told it from that time? Have not I the Lord ?

Is 46 Remember the former things of old and know there is none like me declaring the end from the beginning and from ancient times the things that are not yet done saying My counsel shall stand and I will do all my pleasure

Is 42 Behold the former things are come to pass and new things do I declare before they spring forth I tell you of them

Is 48 3 I have declared the former things from the beginning I did them suddenly and they came to pass Because I know that thou art obstinate that thy spirit is rebellious and thy brow brass I have even declared it to thee before it came to pass lest thou shouldst say that it was the work of thy gods and the effect of their commands

Thou hast seen all this and will not ye declare it? I have shewed thee new things from this time even hidden things and thou didst not know them They are created now and not from the beginning I have kept them hidden from thee lest thou shouldst say Behold I knew them

Yea thou knewest not yea thou heardest not yea from that time that thine ear was not opened for I knew that thou couldst deal very treacherously and wast called a transgressor from the womb

Reprobation of the Jews and conversion of the Gentiles —Is 65 I am sought of them that asked not for me I am found of them that sought me not I said Behold me behold me behold me unto a nation that did not call upon my name

I have spread out my hands all the day unto an unbelieving people which walketh in a way that was not good after their own thoughts a people that provoketh me to anger continually by the sins they commit in my face that sacrificeth to idols etc

These shall be scattered like smoke in the day of my wrath etc

Your iniquities and the iniquities of your fathers will I assemble together and will recompense you for all according to your works

Thus saith the Lord As the new wine is found in the cluster and one saith Destroy it not for a blessing is in it [and the promise of fruit] for my servants sake I will not destroy all Israel

Thus I will bring forth a seed out of Jacob and out of Judah an inheritor of

my mountains, and mine elect and my servants shall inherit it, and my fertile and abundant plains, but I will destroy all others, because you have forgotten your God to serve strange gods I called, and ye did not answer, I spake, and ye did not hear, and ye did choose the thing which I forbade

"Therefore thus saith the Lord, Behold, my servants shall eat, but ye shall be hungry, my servants shall rejoice, but ye shall be ashamed, my servants shall sing for joy of heart, but ye shall cry and howl for vexation of spirit

And ye shall leave your name for a curse unto my chosen for the Lord shall slay thee, and call His servants by another name, that he who blesseth himself in the earth shall bless himself in God, etc , because the former troubles are forgotten

'*For, behold, I create new heavens and a new earth*, and the former things shall not be remembered, nor come into mind

But be ye glad and rejoice for ever in that which I create, for, behold, I create Jerusalem *a rejoicing, and her people a joy*

And I will rejoice in Jerusalem and joy in my people, and the voice of weeping shall no more be heard in her, nor the voice of crying

Before they call, I will answer, and while they are yet speaking, I will hear The wolf and the lamb shall feed together, and the lion shall eat straw like the bullock, and dust shall be the serpent's meat They shall not hurt nor destroy in all my holy mountain '

Is 56 3 Thus saith the Lord, Keep ye judgment, and do justice for my salvation is near to come, and my righteousness to be revealed

Blessed is the man that doeth this, that keepeth the Sabbath, and keepeth his hand from doing any evil

'Neither let the strangers that have joined themselves to me, say God will separate me from His people For thus saith the Lord Whoever will keep my Sabbath, and choose the things that please me, and take hold of my covenant, even unto them will I give in mine house a place and a name better than that of sons and of daughters I will give them an everlasting name, that shall not be cut off

Is 59 9 Therefore for our iniquities is justice far from us we wait for light, but behold obscurity, for brightness, but we walk in darkness We grope for the wall like the blind, we stumble at noonday as in the night we are in desolate places as dead men

We roar all like bears, and mourn sore like doves, we look for judgment, but there is none, *for salvation, but it is far from us*

Is 66 18 But I know their works and their thoughts, it shall come that I will gather all nations and tongues, and they shall see my glory

"And I will set a sign among them, and I will send those that escape of them unto the nations, to Africa, to Lydia, to Italy, to Greece, and to the people that have not heard my fame, neither have seen my glory And they shall bring your brethren '

Jer 7 *Reprobation of the Temple* Go ye unto Shiloth, where I set my name at the first, and see what I did to it for the wickedness of my people And now, because ye have done all these works saith the Lord, I will do unto this house, wherein my name is called upon, wherein ye trust and unto the place which I gave to your priests, as I have done to Shiloth ' (For I have rejected it, and made myself a temple elsewhere)

And I will cast you out of my sight as I have cast out all your brethren even the seed of Ephraim (Rejected for ever) Therefore pray not for this people

Jer 7 22 What avails it you to add sacrifice to sacrifice? For I spake not unto your fathers when I brought them out of the land of Egypt concerning burnt offerings or sacrifices But this thing commanded I them saying Obey and be faithful to my commandments and I will be your God and ye shall be my people (It was only after they had sacrificed to the golden calf that I gave myself sacrifices to turn into good an evil custom)

Jer 7 4 Trust ye not in lying words saying The temple of the Lord the temple of the Lord the temple of the Lord are these

714 The Jews witnesses for God Is 43 9 44 8

Prophecies fulfilled—I Kings 13 2 I Kings 22 16 Joshua 6 26 I Kings 16 34 Deut 23

Malachi 1 11 The sacrifice of the Jews rejected and the sacrifice of the heathen (even out of Jerusalem) and in all places

Moses before dying foretold the calling of the Gentiles Deut 32 21 and the reprobation of the Jews

Moses foretold what would happen to each tribe

Prophecy— Your name shall be a curse unto mine elect and I will give them another name

Make their heart fat and how? by flattering their lust and making them hope to satisfy it

715 *Prophecy*—Amos and Zechariah They have sold the just one and therefore will not be recalled Jesus Christ betrayed

They shall no more remember Egypt See Is 43 16 17 18 19 Jer 23 6 7

Prophecy—The Jews shall be scattered abroad Is 27 6 A new law Jerem 31 32

Malachi *Grotius* The second temple glorious Jesus Christ will come Haggai 2 7 8 9 10

The calling of the Gentiles Joel 2 28 Hosea 2 24 Deut 32 21 Malachi 1 11

716 Hosea 3—Is 42 48 44 60 61 last verse I foretold it long since that they might know that it is I Jaddus to Alexander

717 [*Prophecies*—The promise that David will always have descendants Jer 13 13]

718 The eternal reign of the race of David II Chron by all the prophecies and with an oath And it was not temporally fulfilled Jer 23 20

719 We might perhaps think that when the prophets foretold that the sceptre should not depart from Judah until the eternal King came they spoke to flatter the people and that their prophecy was proved false by Herod But to show that this was not their meaning and that on the contrary they knew well that this

temporal kingdom should cease, they said that they would be without a king and without a prince, and for a long time Hosea 3 4

720 *Non habemus regem nisi Cæsarem* [1] Therefore Jesus Christ was the Messiah, since they had no longer any king but a stranger, and would have no other

721 We have no king but Cæsar

722 Daniel 2 All thy soothsayers and wise men cannot shew unto thee the secret which thou hast demanded But there is a God in heaven who can do so, and that hath revealed to thee in thy dream what shall be in the latter days (This dream must have caused him much misgiving)

And it is not by my own wisdom that I have knowledge of this secret, but by the revelation of this same God, that hath revealed it to me, to make it manifest in thy presence

"Thy dream was then of this kind Thou sawest a great image, high and terrible, which stood before thee His head was of gold, his breast and arms of silver, his belly and his thighs of brass, his legs of iron, his feet part of iron and part of clay Thus thou sawest till that a stone was cut out without hands, which smote the image upon his feet, that were of iron and of clay, and brake them to pieces

'Then was the iron, the clay, the brass, the silver, and the gold broken to pieces together, and the wind carried them away, but this stone that smote the image became a great mountain, and filled the whole earth This is the dream, and now I will give thee the interpretation thereof

Thou who art the greatest of kings, and to whom God hath given a power so vast that thou art renowned among all peoples, art the head of gold which thou hast seen But after thee shall arise another kingdom inferior to thee, and another third kingdom of brass, which shall bear rule over all the earth

'But the fourth kingdom shall be strong as iron, and even as iron breaketh in pieces and subdueth all things, so shall this empire break in pieces and bruise all

And whereas thou sawest the feet and toes, part of clay and part of iron, the kingdom shall be divided, but there shall be in it of the strength of iron and of the weakness of clay

' But as iron cannot be firmly mixed with clay, so they who are represented by the iron and by the clay, shall not cleave one to another though united by marriage

Now in the days of these kings shall God set up a kingdom, which shall never be destroyed, nor ever be delivered up to other people It shall break in pieces and consume all these kingdoms, and it shall stand for ever, according as thou sawest that the stone was cut out of the mountain without hands, and that it fell from the mountain, and brake in pieces the iron, the clay, the silver, and the gold God hath made known to thee what shall come to pass hereafter This dream is certain, and the interpretation thereof sure

Then Nebuchadnezzar fell upon his face towards the earth,' etc

Daniel 8 8 Daniel having seen the combat of the ram and of the he goat, who vanquished him and ruled over the earth, whereof the principal horn being broken four others came up toward *the four winds of heaven, and out of one of* them came forth a little horn which waxed exceedingly great toward the south,

[1] *John 19 15* We have no king but Cæsar

and toward the east and toward the land of Israel and it waxed great even to the host of heaven and it cast down some of the stars and stamped upon them and at last overthrew the prince and by him the daily sacrifice was taken away and the place of his sanctuary was cast down

This is what Daniel saw He sought the meaning of it and a voice cried in this manner Gabriel, make this man to understand the vision And Gabriel said

The ram which thou sawest is the king of the Medes and Persians and the he goat is the king of Greece and the great horn that is between his eyes is the first king of this monarchy

Now that being broken whereas four stood up for it four kingdoms shall stand up out of the nation but not in his power

And in the latter time of their kingdom when iniquities are come to the full there shall arise a king insolent and strong but not by his own power to whom all things shall succeed after his own will and he shall destroy the holy people and through his policy also he shall cause craft to prosper in his hand and he shall destroy many He shall also stand up against the Prince of princes, but he shall perish miserably and nevertheless by a violent hand

Daniel 9 20 Whilst I was praying with all my heart and confessing my sin and the sin of all my people and prostrating myself before my God even Gabriel whom I had seen in the vision at the beginning came to me and touched me about the time of the evening oblation and he informed me and said O Daniel I am now come forth to give thee the knowledge of things At the beginning of thy supplications I came to shew that which thou didst desire for thou are greatly beloved therefore understand the matter and consider the vision Seventy weeks are determined upon thy people and upon thy holy city to finish the transgression and to make an end of sins and to abolish iniquity and to bring in everlasting righteousness to accomplish the vision and the prophecies and to anoint the Most Holy (After which this people shall be no more thy people nor this city the holy city The times of wrath shall be passed and the years of grace shall come for ever)

Know therefore and understand that from the going forth of the commandment to restore and to build Jerusalem unto the Messiah the Prince shall be seven weeks and three score and two weeks (The Hebrews were accustomed to divide numbers and to place the small first Thus 7 and 62 make 69 Of this 70 there will then remain the 70th that is to say the 7 last years of which he will speak next)

The street shall be built again and the wall even in troublous times And after three score and two weeks (which have followed the first seven Christ will then be killed after the sixty nine weeks that is to say in the last week) the Christ shall be cut off and a people of the prince that shall come shall destroy the city and the sanctuary and overwhelm all and the end of that war shall accomplish the desolation

Now one week (which is the seventieth which remains) shall confirm the covenant with many and in the midst of the week (that is to say the last three and a half years) he shall cause the sacrifice and the oblation to cease and for the overspreading of abominations he shall make it desolate even until the consummation and that determined shall be poured upon the desolate

Daniel 11 The angel said to Daniel There shall stand up yet (after Cyrus under whom this still is) three kings in Persia (Cambyses Smerdis Darius)

"and the fourth who shall then come, (Xerxes) "shall be far richer than they all, and far stronger, and shall stir up all his people against the Greeks

But a mighty king shall stand up, (Alexander), "that shall rule with great dominion, and do according to his will And when he shall stand up, his kingdom shall be broken, and shall be divided in four parts toward the four winds of heaven," (as he had said above, 7 6, 8 8), 'but not his posterity, and his successors shall not equal his power, for his kingdom shall be plucked up, even for others besides these," (his four chief successors)

And the king of the south, (Ptolemy, son of Lagos, Egypt), "shall be strong, but one of his princes shall be strong above him, and his dominion shall be a great dominion," (Seleucus, King of Syria Appian says that he was the most powerful of Alexander s successors)

And in the end of years they shall join themselves together, and the king's daughter of the south, (Berenice, daughter of Ptolemy Philadelphus, son of the other Ptolemy), shall come to the king of the north, (to Antiochus Deus, King of Syria and of Asia, son of Seleucus Lagidas), ' to make peace between these princes

"But neither she nor her seed shall have a long authority, for she and they that brought her, and her children, and her friends, shall be delivered to death (Berenice and her son were killed by Seleucus Callinicus)

' But out of a branch of her roots shall one stand up," (Ptolemy Euergetes was the issue of the same father as Berenice), which shall come with a mighty army into the land of the king of the north, where he shall put all under subjection, and he shall also carry captive into Egypt their gods, their princes, their gold, their silver, and all their precious spoils, ' (if he had not been called into Egypt by domestic reasons, says Justin, he would have entirely stripped Seleucus), and he shall continue several years when the king of the north can do nought against him

'And so he shall return into his kingdom But his sons shall be stirred up, and shall assemble a multitude of great forces,' (Seleucus Ceraunus, Antiochus the Great) "And their army shall come and overthrow all, wherefore the king of the south shall be moved with choler, and shall also form a great army, and fight him, (Ptolemy Philopator against Antiochus the Great at Raphia), and conquer, and his troops shall become insolent, and his heart shall be lifted up, (this Ptolemy desecrated the temple, Josephus) he shall cast down many ten thousands, but he shall not be strengthened by it For the king of the north, (Antiochus the Great), 'shall return with a greater multitude than before, and in those times also a great number of enemies shall stand up against the king of the south, (during the reign of the young Ptolemy Epiphanes), also the apostates and robbers of thy people shall exalt themselves to establish the vision, but they shall fall (Those who abandon their religion to please Euergetes when he will send his troops to Scopas, for Antiochus will again take Scopas and conquer them) And the king of the north shall destroy the fenced cities, and the arms of the south shall not withstand and all shall yield to his will, he shall stand in the land of Israel, and it shall yield to him And thus he shall think to make himself master of all the empire of Egypt, (despising the youth of Epiphanes says Justin)

And for that he shall make alliance with him and give his daughter (Cleopatra, in order that she may betray her husband On which Appian says that, doubting

his ability to make himself master of Egypt by force because of the protection of the Romans he wished to attempt it by cunning) He shall wish to corrupt her but she shall not stand on his side neither be for him Then he shall turn his face to other designs and shall think to make himself master of some isles (that is to say seaports) and shall take many (as Appian says)

But a prince shall oppose his conquests (Scipio Africanus who stopped the progress of Antiochus the Great because he offended the Romans in the person of their allies) and shall cause the reproach offered by him to cease He shall then return into his kingdom and there perish and be no more (He was slain by his soldiers)

And he who shall stand up in his estate (Seleucus Philopator or Soter the son of Antiochus the Great) shall be a tyrant a raiser of taxes in the glory of the kingdom (which means the people) but within a few days he shall be destroyed neither in anger nor in battle And in his place shall stand up a vile person unworthy of the honour of the kingdom but he shall come in cleverly by flatteries All armies shall bend before him he shall conquer them and even the prince with whom he has made a covenant For having renewed the league with him he shall work deceitfully and enter with a small people into his province peaceably and without fear He shall take the fattest places and shall do that which his fathers have not done and ravage on all sides He shall forecast great devices during his time

723 *Prophecies* —The seventy weeks of Daniel are ambiguous as regards the term of commencement because of the terms of the prophecy and as regards the term of conclusion because of the differences among chronologists But all this difference extends only to two hundred years

724 *Predictions* —That in the fourth monarchy before the destruction of the second temple before the dominion of the Jews was taken away in the seventieth week of Daniel during the continuance of the second temple the heathen should be instructed and brought to the knowledge of the God worshipped by the Jews that those who loved Him should be delivered from their enemies and filled with His fear and love

And it happened that in the fourth monarchy before the destruction of the second temple etc the heathen in great number worshipped God and led an angelic life Maidens dedicated their virginity and their life to God Men renounced their pleasures What Plato could only make acceptable to a few men specially chosen and instructed a secret influence imparted by the power of a few words to a hundred million ignorant men

The rich left their wealth Children left the dainty homes of their parents to go into the rough desert (See Philo the Jew) All this was foretold a great while ago For two thousand years no heathen had worshipped the God of the Jews and at the time foretold a great number of the heathen worshipped this only God The temples were destroyed The very kings made submission to the cross All this was due to the Spirit of God which was spread abroad upon the earth

No heathen since Moses until Jesus Christ believed according to the very Rabbis A great number of the heathen after Jesus Christ believed in the books of Moses kept them in substance and spirit and only rejected what was useless

725 *Prophecies*—The conversion of the Egyptians (Isaiah 19 19), an altar in Egypt to the true God

726 *Prophecies*—*In Egypt Pugio Fidei*, p 659 *Talmud*

It is a tradition among us, that, when the Messiah shall come, the house of God, destined for the dispensation of His Word, shall be full of filth and impurity, and that the wisdom of the scribes shall be corrupt and rotten Those who shall be afraid to sin, shall be rejected by the people, and treated as senseless fools

Is xlix 'Listen, O isles, unto me, and hearken, ye people, from afar The Lord hath called me by my name from the womb of my mother, in the shadow of His hand hath He hid me, and hath made my words like a sharp sword, and said unto me, Thou art my servant in whom I will be glorified Then I said, Lord, have I laboured in vain? have I spent my strength for nought? yet surely my judgment is with Thee, O Lord, and my work with Thee And now, saith the Lord, that formed me from the womb to be His servant, to bring Jacob and Israel again to Him, Thou shalt be glorious in my sight, and I will be thy strength It is a light thing that thou shouldst convert the tribes of Jacob, I have raised thee up for a light to the Gentiles, that thou mayest be my salvation unto the ends of the earth Thus saith the Lord to him whom man despiseth, to him whom the nation abhorreth, to a servant of rulers, Princes and kings shall worship thee, because the Lord is faithful that hath chosen thee

' Again saith the Lord unto me, I have heard thee in the days of salvation and of mercy, and I will preserve thee for a covenant of the people, to cause to inherit the desolate nations, that thou mayest say to the prisoners Go forth, to them that are in darkness show yourselves, and possess these abundant and fertile lands They shall not hunger nor thirst, neither shall the heat nor sun smite them, for he that hath mercy upon them shall lead them, even by the springs of waters shall he guide them, and make the mountains a way before them Behold, the peoples shall come from all parts, from the east and from the west, from the north and from the south Let the heavens give glory to God, let the earth be joyful, for it hath pleased the Lord to comfort His people, and He will have mercy upon the poor who hope in Him

Yet Zion dared to say The Lord hath forsaken me, and hath forgotten me Can a woman forget her child, that she should not have compassion on the son of her womb? but if she forget, yet will not I forget thee, O Sion I will bear thee always between my hands, and thy walls are continually before me They that shall build thee are come, and thy destroyers shall go forth of thee Lift up thine eyes round about, and behold, all these gather themselves together, and come to thee As I live, saith the Lord thou shalt surely clothe thee with them all, as with an ornament Thy waste and thy desolate places, and the land of thy destruction shall even now be too narrow by reason of the inhabitants and the children thou shalt have after thy barrenness shall say again in thy ears The place is too strait for me give place to me that I may dwell Then shalt thou say in thy heart Who hath begotten me these, seeing I have lost my children, and am desolate, a captive, and removing to and fro? and who brought up these? Behold I was left alone, these where had they been? And the Lord shall say to thee Behold, I will lift up mine hand to the Gentiles and set up my standard to the people and they shall bring thy sons in their arms and in their bosoms And kings shall be their

nursing fathers and queens their nursing mothers they shall bow down to thee with their face toward the earth and lick up the dust of thy feet and thou shalt know that I am the Lord for they shall not be ashamed that wait for me Shall the prey be taken from the mighty? But even if the captives be taken away from the strong nothing shall hinder me from saving thy children and from destroying thy enemies and all flesh shall know that I am the Lord thy Saviour and thy Redeemer the mighty One of Jacob

Thus saith the Lord What is the bill of this divorcement wherewith I have put away the synagogue? and why have I delivered it into the hand of your enemies? Is it not for your iniquities and for your transgressions that I have put it away?

For I came and no man received me I called and there was none to hear Is my arm shortened that I cannot redeem?

Therefore I will show the tokens of mine anger I will clothe the heavens with darkness and make sackcloth their covering

The Lord hath given me the tongue of the learned that I should know how to speak a word in season to him that is weary He hath opened mine ear and I have listened to Him as a master

The Lord hath revealed His will and I was not rebellious

I gave my body to the smiters and my cheeks to outrage I hid not my face from shame and spitting But the Lord hath helped me therefore I have not been confounded

He is near that justifieth me who will contend with me? who will be mine adversary and accuse me of sin God himself being my protector?

All men shall pass away and be consumed by time let those that fear God hearken to the voice of His servant let him that languisheth in darkness put his trust in the Lord But as for you ye do but kindle the wrath of God upon you ye walk in the light of your fire and in the sparks that ye have kindled This shall ye have of mine hand ye shall lie down in sorrow

Hearken to me ye that follow after righteousness ye that seek the Lord look unto the rock whence ye are hewn and to the hole of the pit whence ye are digged Look unto Abraham your father and unto Sarah that bare you for I called him alone when childless and increased him Behold I have comforted Zion and heaped upon her blessings and consolations

Hearken unto me my people and give ear unto me for a law shall proceed from me and I will make my judgment to rest for a light of the Gentiles

Amos viii The prophet having enumerated the sins of Israel said that God had sworn to take vengeance on them

He says this And it shall come to pass in that day saith the Lord that I will cause the sun to go down at noon and I will darken the earth in the clear day and I will turn your feasts into mourning and all your songs into lamentation

You all shall have sorrow and suffering and I will make this nation mourn as for an only son and the end therefore as a bitter day Behold the days come saith the Lord that I will send a famine in the land not a famine of bread nor a thirst for water but of hearing the words of the Lord And they shall wander from sea to sea and from the north even to the east they shall run to and fro to seek the word of the Lord and shall not find it

In that day shall the fair virgins and young men faint for thirst They that have

followed the idols of Samaria, and sworn by the god of Dan, and followed the manner of Beersheba, shall fall, and never rise up again '

Amos 3 2 ' Ye only have I known of all the families of the earth for my people '

Daniel 12 7 Having described all the extent of the reign of the Messiah, he says ' All these things shall be finished, when the scattering of the people of Israel shall be accomplished "

Haggai 2 4 'Ye who, comparing this second house with the glory of the first, despise it, be strong, saith the Lord, be strong, O Zerubbabel, and O Jesus, the high priest, be strong, all ye people of the land, and work For I am with you, saith the Lord of hosts, according to the word that I covenanted with you when ye came out of Egypt, so my spirit remaineth among you Fear ye not For thus saith the Lord of hosts Yet one little while, and I will shake the heavens, and the earth, and the sea, and the dry land, ' (a way of speaking to indicate a great and an extraordinary change), and I will shake all nations, and the desire of all the Gentiles shall come, and I will fill this house with glory, saith the Lord

The silver is mine, and the gold is mine, saith the Lord, (that is to say, it is not by that that I wish to be honoured, as it is said elsewhere All the beasts of the field are mine, what advantages me that they are offered me in sacrifice?) The *glory of this latter house shall be greater than of the former, saith the Lord of* hosts, and in this place will I establish my house, saith the Lord

"According to all that thou desiredst in Horeb in the day of the assembly, saying, *Let us not hear again the voice of the Lord, neither let us see this fire any* more, that we die not And the Lord said unto me, Their prayer is just I will raise them up a prophet from among their brethren, like unto thee, and will put my words in his mouth, and he shall speak unto them all that I shall command him And it shall come to pass, that whosoever will not hearken unto my words which he will speak in my name, I will require it of him

Genesis 49 Judah, thou art he whom thy brethren shall praise, and thou shalt conquer thine enemies, thy father s children shall bow down before thee Judah is a lion's whelp from the prey, my son, thou art gone up, and art couched as a lion, and as a lioness that shall be roused up

The sceptre shall not depart from Judah, nor a lawgiver from between his feet, until Shiloh come, and unto him shall the gathering of the people be

727 *During the life of the Messiah Ænigmatis* Ezek 17

His forerunner Malachi 3

He will be born an infant Is 9

He will be born in the village of Bethlehem Micah 5 *He will appear chiefly in* Jerusalem and will be a descendant of the family of Judah and of David

He is to blind the learned and the wise Is 6 8 29 etc , and to preach the Gospel to the lowly, Is 29, to open the eyes of the blind give health to the sick, and bring light to those that languish in darkness Is 61

He is to show the perfect way, and be the teacher of the Gentiles Is 55 43 1—7

The prophecies are to be unintelligible to the wicked, Dan 12, Hosea 14 10, but they are to be intelligible to those who are well informed

The prophecies, which represent Him as poor represent Him as master of the nations Is 52 14, etc , 53, Zech 9 9

The prophecies which foretell the time foretell Him only as master of the nations and suffering and not as in the clouds nor as judge And those which represent Him thus as judge and in glory do not mention the time When the Messiah is spoken of as great and glorious it is as the judge of the world and not its Redeemer

He is to be the victim for the sins of the world Is 39 53 etc

He is to be the precious corner stone Is 28 16

He is to be a stone of stumbling and offence Is viii Jerusalem is to dash against this stone

The builders are to reject this stone Ps 117 22

God is to make this stone the chief corner stone

And this stone is to grow into a huge mountain and fill the whole earth Dan 2

So He is to be rejected despised betrayed (Ps 108 8) sold (Zech 11 12) spit upon buffeted mocked afflicted in innumerable ways given gall to drink (Ps 68) pierced (Zech 12), His feet and His hands pierced slain and lots cast for His raiment

He will rise again (Ps 15) the third day (Hosea 6 3)

He will ascend to heaven to sit on the right hand Ps 110

The kings will arm themselves against Him Ps 2

Being on the right hand of the Father He will be victorious over His enemies

The kings of the earth and all nations will worship Him Is lx

The Jews will continue as a nation Jeremiah

They will wander without kings etc (Hosea 3) without prophets (Amos) looking for salvation and finding it not (Isaiah)

Calling of the Gentiles by Jesus Christ Is 52 15 55 5 60 etc Ps 81

Hosea 1 9 Ye are not my people and I will not be your God when ye are multiplied after the dispersion In the places where it was said Ye are not my people I will call them my people

728 It was not lawful to sacrifice outside of Jerusalem which was the place that the Lord had chosen nor even to eat the tithes elsewhere Deut 12 5 etc Deut 14 23 etc 15 20 16 2 7 11 15

Hosea foretold that they should be without a king without a prince without a sacrifice and without an idol and this prophecy is now fulfilled as they cannot make a lawful sacrifice out of Jerusalem

729 *Predictions* —It was foretold that in the time of the Messiah He should come to establish a new covenant which should make them forget the escape from Egypt (Jer 23 5 Is 43 10) that He should place His law not in externals but in the heart that He should put His fear which had only been from without in the midst of the heart Who does not see the Christian law in all this?

730 That then idolatry would be overthrown that this Messiah would cast down all idols and bring men into the worship of the true God

That the temples of the idols would be cast down and that among all nations and in all places of the earth He would be offered a pure sacrifice not of beasts

That He would be king of the Jews and Gentiles And we see this king of the Jews and Gentiles oppressed by both who conspire His death and ruler of both

destroying the worship of Moses in Jerusalem, which was its centre, where He made His first Church, and also the worship of idols in Rome, the centre of it, where He made His chief Church

731 *Prophecies* —That Jesus Christ will sit on the right hand, till God has subdued His enemies

Therefore He will not subdue them Himself

732 Then they shall teach no more every man his neighbour, saying, Here is the Lord, *for God shall make Himself known to all*

" Your sons shall prophesy I will put my spirit and my fear *in your heart* '

All that is the same thing To prophesy is to speak of God, not from outward proofs, but from an inward and immediate feeling

733 That He would teach men the perfect way

And there has never come, before Him nor after Him, any man who has taught anything divine approaching to this

734 That Jesus Christ would be small in His beginning, and would then increase The little stone of Daniel

If I had in no wise heard of the Messiah, nevertheless, after such wonderful predictions of the course of the world which I see fulfilled, I see that He is divine And, if I knew that these same books foretold a Messiah, I should be sure that He would come, and seeing that they place His time before the destruction of the second temple, I should say that He had come

735 *Prophecies* —That the Jews would reject Jesus Christ, and would be rejected of God, for this reason, that the chosen vine brought forth only wild grapes That the chosen people would be fruitless, ungrateful, and unbelieving, *populum non credentem et contradicentem* [1] That God would strike them with blindness, and in full noon they would grope like the blind, and that a forerunner would go before Him

736 *Transfixerunt* [2] Zech 12 10

That a deliverer should come, who would crush the demon s head, and free His people from their sins, *ex omnibus iniquitatibus* [3] that there should be a New Covenant, which would be eternal, that there should be another priesthood after the order of Melchisedek, and it should be eternal, that the Christ should be glorious, mighty, strong, and yet so poor that He would not be recognised, nor taken for what He is, but rejected and slain, that His people who denied Him should no longer be His people, that the idolaters should receive Him and take refuge in Him, that He should leave Zion to reign in the centre of idolatry, that nevertheless the Jews should continue for ever, that He should be of Judah, and when there should be no longer a king

[1] Is 65 2 A rebellious people which walketh in a way that was not good
[2] They have pierced
[3] Ps 130 8 from all his iniquities

SECTION XII

PROOFS OF JESUS CHRIST

737 Therefore I reject all other religions In that way I find an answer to all objections It is right that a God so pure should only reveal Himself to those whose hearts are purified Hence this religion is lovable to me and I find it now sufficiently justified by so divine a morality But I find more in it

I find it convincing that since the memory of man has lasted it was constantly announced to men that they were universally corrupt but that a Redeemer should come that it is not one man who said it but innumerable men and a whole nation expressly made for the purpose and prophesying for four thousand years This is a nation which is more ancient than every other nation Their books scattered abroad are four thousand years old

The more I examine them the more truths I find in them an entire nation foretell Him before His advent and an entire nation worship Him after His advent what has preceded and what has followed in short people without idols and kings this synagogue which was foretold and these wretches who frequent it and who being our enemies are admirable witnesses of the truth of these prophecies wherein their wretchedness and even their blindness are foretold

I find this succession this religion wholly divine in its authority in its duration in its perpetuity in its morality in its conduct in its doctrine in its effects The frightful darkness of the Jews was foretold *Eris palpans in meridie*[1] *Dabitur liber scienti literas et dicet Non possum legere*[2] While the sceptre was still in the hands of the first foreign usurper there is the report of the coming of Jesus Christ

So I hold out my arms to my *Redeemer* who having been foretold for four thousand years has come to suffer and to die for me on earth at the time and under all the circumstances foretold By His grace I await death in peace in the hope of being eternally united to Him Yet I live with joy whether in the prosperity which it pleases Him to bestow upon me or in the adversity which He sends for my good and which He has taught me to bear by His example

738 The prophecies having given different signs which should all happen at the advent of the Messiah it was necessary that all these signs should occur at the same time So it was necessary that the fourth monarchy should have come when the seventy weeks of Daniel were ended and that the sceptre should have then departed from Judah And all this happened without any difficulty Then it was necessary that the Messiah should come and Jesus Christ then came who was called the Messiah And all this again was without difficulty This indeed shows the truth of the prophecies

739 The prophets foretold and were not foretold The saints again were foretold but did not foretell Jesus Christ both foretold and was foretold

[1]Deut 28 9 *Et palpes in meridie* And thou shalt grope at noonday

[2]Is 29 11 *Quem (lib um) cum dederint scienti litteras et r spondebit Non possum* Which men deliver to one that is learned and he saith I cannot

740 Jesus Christ, whom the two Testaments regard, the Old as its hope, the New as its model, and both as their centre

741 The two oldest books in the world are those of Moses and Job, the one a Jew and the other a Gentile Both of them look upon Jesus Christ as their com mon centre and object Moses in relating the promises of God to Abraham, Jacob, etc , and his prophecies, and Job, *Quis mihi det ut*, etc *Scio enim quod redemptor meus vivit*, etc [1]

742 The Gospel only speaks of the virginity of the Virgin up to the time of the birth of Jesus Christ All with reference to Jesus Christ

743 *Proofs of Jesus Christ*
Why was the book of Ruth preserved?
Why the story of Tamar?

744 "Pray that ye enter not into temptation" It is dangerous to be tempted, and people are tempted because they do not pray
Et tu conversus confirma fratres tuos But before, *conversus Jesus respexit Petrum* [2]
Saint Peter asks permission to strike Malchus and strikes before hearing the answer Jesus Christ replies afterwards
The word, *Galilee*, which the Jewish mob pronounced as if by chance, in accusing Jesus Christ before Pilate, afforded Pilate a reason for sending Jesus Christ to Herod And thereby the mystery was accomplished, that He should be judged by Jews and Gentiles Chance was apparently the cause of the accomplishment of the mystery

745 Those who have a difficulty in believing seek a reason in the fact that the Jews do not believe "Were this so clear," say they, "why did the Jews not believe?" And they almost wish that they had believed, so as not to be kept back by the example of their refusal But it is their very refusal that is the foundation of our faith We should be much less disposed to the faith, if they were on our side We should then have a more ample pretext The wonderful thing is to have made the Jews great lovers of the things foretold, and great enemies of their fulfilment

746 The Jews were accustomed to great and striking miracles, and so, having had the great miracles of the Red Sea and of the land of Canaan as an epitome of the great deeds of their Messiah, they therefore looked for more striking miracles, of which those of Moses were only the patterns

747 The carnal Jews and the heathen have their calamities and Christians also There is no Redeemer for the heathen, for they do not so much as hope for one There is no Redeemer for the Jews, they hope for Him in vain There is a Re deemer only for Christians (See *Perpetuity*)

[1] Job 19 23 25 for I know that my redeemer liveth
[2] Luke 22 32 61 And when thou art converted strengthen thy brother And the Lord turned and looked upon Peter

748 In the time of the Messiah the people divided themselves The spiritual embraced the Messiah and the coarser minded remained to serve as witnesses of Him

749 If this was clearly foretold to the Jews how did they not believe it or why were they not destroyed for resisting a fact so clear?

I reply in the first place it was foretold both that they would not believe a thing so clear and that they would not be destroyed And nothing is more to the glory of the Messiah for it was not enough that there should be prophets their prophets must be kept above suspicion Now etc

750 If the Jews had all been converted by Jesus Christ we should have none but questionable witnesses And if they had been entirely destroyed we should have no witnesses at all

751 What do the prophets say of Jesus Christ? That He will be clearly God? No but that He is a God truly hidden that He will be slighted that none will think that it is He that He will be a stone of stumbling upon which many will stumble etc Let people then reproach us no longer for want of clearness since we make profession of it

But it is said there are obscurities And without that no one would have stumbled over Jesus Christ and this is one of the formal pronouncements of the prophets *Excæca* [1]

752 Moses first teaches the Trinity original sin the Messiah

David a great witness a king good merciful a beautiful soul a sound mind powerful He prophesies and his wonder comes to pass This is infinite

He had only to say that he was the Messiah if he had been vain for the prophecies are clearer about him than about Jesus Christ And the same with Saint John

753 Herod was believed to be the Messiah He had taken away the sceptre from Judah but he was not of Judah This gave rise to a considerable sect

Curse of the Greeks upon those who count three periods of time

In what way should the Messiah come seeing that through Him the sceptre was to be eternally in Judah and at His coming the sceptre was to be taken away from Judah?

In order to effect that seeing they should not see and hearing they should not understand nothing could be better done

754 *Homo existens te Deum facit* [2]
Scriptum est Dii estis et non potest solvi Scriptura [3]
Hæc infirmitas non est ad vitam et est ad mortem [4]
Lazarus dormit et deinde dixit Lazarus mortuus est [5]

[1] Is 6 10 Shut their eyes
[2] The man who exists makes you God
[3] It is written You are Gods (Ps 80 6) and the Scripture cannot be made naught of
[4] This weakness is not for life it is for death
[5] John 11 11 and 14 Lazarus sleeps and later it says Lazarus is dead

755 The apparent discrepancy of the Gospels

756 What can we have but reverence for a man who foretells plainly things which come to pass, and who declares his intention both to blind and to enlighten, and who intersperses obscurities among the clear things which come to pass?

757 The time of the first advent was foretold, the time of the second is not so, because the first was to be obscure, and the second is to be brilliant and so manifest that even His enemies will recognise it But, as He was first to come only in obscurity and to be known only of those who searched the Scriptures

758 God, in order to cause the Messiah to be known by the good and not to be known by the wicked, made Him to be foretold in this manner If the manner of the Messiah had been clearly foretold, there would have been no obscurity, even for the wicked If the time had been obscurely foretold, there would have been obscurity, even for the good For their [goodness of heart] would not have made them understand, for instance, that the closed *mem* signifies six hundred years But that time has been clearly foretold, and the manner in types

By this means, the wicked, taking the promised blessings for material blessings, have fallen into error, in spite of the clear prediction of the time, and the good have not fallen in error For the understanding of the promised blessings depends on the heart, which calls *good* that which it loves, but the understanding of the promised time does not depend on the heart And thus the clear prediction of the time, and the obscure prediction of the blessings, deceive the wicked alone

759 [Either the Jews or the Christians must be wicked]

760 The Jews reject Him, but not all The saints receive Him, and not the carnal minded And so far is this from being against His glory, that it is the last touch which crowns it For their argument, the only one found in all their writings, in the Talmud and in the Rabbinical writings, amounts only to this, that Jesus Christ has not subdued the nations with sword in hand, *gladium tuum, potentissime* [1] (Is this all they have to say? Jesus Christ has been slain, say they He has failed He has not subdued the heathen with His might He has not bestowed upon us their spoil He does not give riches Is this all they have to say? It is in this respect that He is lovable to me I would not desire Him whom they fancy) It is evident that it is only His life which has prevented them from accepting Him, and through this rejection they are irreproachable witnesses, and, what is more, they thereby accomplish the prophecies

[By means of the fact that this people have not accepted Him, this miracle here has happened The prophecies were the only lasting miracles which could be wrought, but they were liable to be denied]

761 The Jews in slaying Him in order not to receive Him as the Messiah have given Him the final proof of being the Messiah

And in continuing not to recognise Him they made themselves irreproachable

[1] Ps 44 4 Gladio tuo— Thy sword O most mighty

witnesses Both in slaying Him and in continuing to deny Him they have fulfilled the prophecies (Is 60 Ps 71)

762 What could the Jews His enemies do? If they receive Him they give proof of Him by their reception for then the guardians of the expectation of the Messiah receive Him *If they reject Him they give proof of Him by their rejection*

763 The Jews in testing if He were God have shown that He was man

764 The Church has had as much difficulty in showing that Jesus Christ was man against those who denied it as in showing that He was God and the probabilities were equally great

765 *Source of contradictions* —A God humiliated even to the death on the cross a Messiah triumphing over death by his own death Two natures in Jesus Christ two advents two states of man s nature

766 *Types* —Saviour father sacrificer offering food king wise law giver afflicted poor having to creat a people whom He must lead and nourish and bring into His land

Jesus Christ Offices —He alone had to create a great people elect holy and chosen to lead nourish and bring it into the place of rest and holiness to make *it holy to God to make it the temple of God to reconcile it to and save it from* the wrath of God to free it from the slavery of sin which visibly reigns in man to give laws to this people and engrave these laws on their heart to offer Himself to God for them and sacrifice Himself for them to be a victim without blemish and Himself the sacrificer having to offer Himself His body and His blood and yet to offer bread and wine to God

Ingrediens mundum [1]

Stone upon stone

What preceded and what followed All the Jews exist still and are wanderers

767 Of all that is on earth He partakes only of the sorrows not of the joys He loves His neighbours but His love does not confine itself within these bounds and overflows to His own enemies and then to those of God

768 Jesus Christ typified by Joseph the beloved of his father sent by his father to see his brethren etc innocent sold by his brethren for twenty pieces of silver and thereby becoming their lord their saviour the saviour of strangers and the saviour of the world which had not been but for their plot to destroy him their sale and their rejection of him

In prison Joseph innocent between two criminals Jesus Christ on the cross between two thieves Joseph foretells freedom to the one and death to the other from the same omens Jesus Christ saves the elect and condemns the outcast for the same sins Joseph foretells only Jesus Christ acts Joseph asks him who will be saved to remember him when he comes into his glory and he whom Jesus Christ saves asks that He will remember him when He comes into His kingdom

[1]Heb 10 5 When he cometh into the world

769 The conversion of the heathen was only reserved for the grace of the Messiah The Jews have been so long in opposition to them without success, all that Solomon and the prophets said has been useless Sages, like Plato and Socrates, have not been able to persuade them

770 After many persons had gone before, Jesus Christ at last came to say "Here am I, and this is the time That which the prophets have said was to come in the fullness of time, I tell you my apostles will do The Jews shall be cast out *Jerusalem shall be soon destroyed And the heathen shall enter into the* knowledge of God My apostles shall do this after you have slain the heir of the vineyard "

Then the apostles said to the Jews 'You shall be accursed," (*Celsus laughed at it*), and to the heathen, "You shall enter into the knowledge of God And this then came to pass

771 Jesus Christ came to blind those who saw clearly, and to give sight to the blind, to heal the sick, and leave the healthy to die, to call to repentance, and to justify sinners, and to leave the righteous in their sins, to fill the needy, and leave the rich empty

772 *Holiness —Effundam spiritum meum* [1] All nations were in unbelief and lust The whole world now became fervent with love Princes abandoned their pomp, maidens suffered martyrdom Whence came this influence? The Messiah was come These were the effect and sign of His coming

773 Destruction of the Jews and heathen by Jesus Christ *Omnes gentes venient et adorabunt eum* [2] *Parum est ut,*[3] etc *Postula a me* [4] *Adorabunt eum omnes reges* [5] *Testes iniqui* [6] *Dabit maxillam percutienti* [7] *Dederunt fel in escam* [8]

774 Jesus Christ for all, Moses for a nation

The Jews blessed in Abraham I will bless those that bless thee But All nations blessed in his seed *Parum est ut,*[3] etc

Lumen ad revelationem gentium [9]

Non fecit taliter omni nationi, said David, in speaking of the Law But, in speaking of Jesus Christ, we must say *Fecit taliter omni nationi* [10] *Parum est ut,*[3] etc , Isaiah So it belongs to Jesus Christ to be universal Even the Church offers sacrifice only for the faithful Jesus Christ offered that of the cross for all

775 There is heresy in always explaining *omnes* by *all*, and heresy is not explain-

[1] Joel 2 28 I will pour out my spirit
[2] Ps 21 28 All peoples shall come and worship him
[3] Is 49 6 It is a light thing that thou shouldst be my servant etc
[4] Ps 2 8 Ask of me
[5] Ps 71 11 *All kings shall fall down before him*
[6] Ps 34 11 Witnesses rise up
[7] Lam 3 30 He giveth his cheek to him that smiteth him
[8] Ps 68 22 *Dederunt in escam meam fel* They gave me also gall for my meat
[9] Luke 2 32 A light to lighten the Gentiles
[10] Ps 147 20 He hath not dealt so with any nation

ing it sometimes by *all* *Bibite ex hoc omnes*[1] The Huguenots are heretics in explaining it by *all* *In quo omnes peccaverunt*[2] the Huguenots are heretics in excepting the children of true believers We must then follow the Fathers and tradition in order to know when to do so since there is heresy to be feared on both sides

776 *Ne timeas pusillus grex*[3] *Timore et tremore*[4]—*Quid ergo? Ne timeas* [*modo*] *timeas* Fear not provided you fear but if you fear not then fear

Qui me recipit non me recipit sed eum qui me misit[5]

Nemo scit neque Filius[6]

Nubes lucida obumbravit[7]

Saint John was to turn the hearts of the fathers to the children and Jesus Christ to plant division There is not contradiction

777 The effects *in communi* and *in particulari* The semi Pelagians err in saying of *in communi* what is true only *in particulari* and the Calvinists in saying *in particulari* what is true *in communi* (Such is my opinion)

778 *Omnis Judaea regio et Jerosolmymi universi et baptizabantur*[8] Because of all the conditions of men who came there

From these stones there *can* come children unto Abraham

779 If men knew themselves God would heal and pardon them *Ne convertantur et sanem eos et dimittantur eis peccata*[9]

780 Jesus Christ never condemned without hearing To Judas *Amice ad quid venisti?*[10] To him that had not on the wedding garment the same

781 The types of the completeness of the Redemption as that the sun gives light to all indicate only completeness but [*the types*] of exclusions as of the Jews elected to the exclusion of the Gentiles indicate exclusion

Jesus Christ the Redeemer of all Yes for He has offered like a man who has ransomed all those who were willing to come to Him If any die on the way it is their misfortune but so far as He was concerned He offered them redemption That holds good in this example where he who ransoms and he who prevents death are two persons but not of Jesus Christ who does both these things No for Jesus Christ in the quality of Redeemer is not perhaps Master of all and thus in so far as it is in Him He is the Redeemer of all

When it is said that Jesus Christ did not die for all you take undue advantage

[1]Matt 26 27 Drink ye all of it
[2]Rom 5 12 for that all have sinned
[3]Luke 12 32 Fear not little flock
[4]Phil 2 12 With fear and trembling
[5]Mark 9 37 Whosoever receiveth me receiveth not me but him that sent me
[6]Mark 13 32 No one knows neither the Son but the Father
[7] Clouds shadowed over the light
[8]Mark 1 5 All the land of Judaea and they of Jerusalem and were all baptized of him
[9]Mark 4 12 Lest they should be converted and their sins should be forgiven them
[10]Matt 26 50 Friend wherefore art thou come?

of a fault in men who at once apply this exception *to themselves, and this is to* favour despair, instead of turning them from it to favour hope For men thus accustom themselves in inward virtues by outward customs

782 The victory over death What is a man advantaged if he gain the whole world and lose his own soul? Whosoever will save his soul, shall lose it '

I am not come to destroy the law, but to fulfil '

"Lambs took not away the sins of the world, but I am the lamb which taketh away the sins "

' Moses hath not led you out of captivity, and made you truly free '

783 Then Jesus Christ comes to tell men that they have no other enemies but themselves, that it is their passions which keep them apart from God, that He comes to destroy these, and give them His grace, so as to make of them all one Holy Church, that He comes to bring back into this Church the heathen and Jews, that He comes to destroy the idols of the former and the superstition of the latter To this all men are opposed, not only from the natural opposition of lust, but, above all, the kings of the earth, as had been foretold, join together to destroy this religion at its birth (*Proph Quare fremuerunt gentes reges terræ adversus Christum*)[1]

All that is great on earth is united together, the learned, the wise, the kings The first write, the second condemn, the last kill And notwithstanding all these oppositions, these men, simple and weak, resist all these powers, subdue even these kings, these learned men and these sages, and remove idolatry from all the earth And all this is done by the power which had foretold it

784 Jesus Christ would not have the testimony of devils, nor of those who were not called, but of God and John the Baptist

785 I consider Jesus Christ in all persons and in ourselves Jesus Christ as a Father in His Father, Jesus Christ as a Brother in His Brethren, Jesus Christ as poor in the poor, Jesus Christ as rich in the rich, Jesus Christ as Doctor and Priest in priests, Jesus Christ as Sovereign in princes etc For by His glory He is all that is great, being God, and by His mortal life He is all that is poor and abject Therefore He has taken this unhappy condition, so that He could be in all persons and the model of all conditions

786 Jesus Christ is an obscurity (according to what the world calls obscurity), such that historians, writing only of important matters of states, have hardly noticed Him

787 *On the fact that neither Josephus, nor Tacitus, nor other historians have spoken of Jesus Christ* —So far is this from telling against Christianity that on the contrary it tells for it For it is certain that Jesus Christ has existed, that His religion has made a great talk, and that these persons were not ignorant of it Thus it is plain that they purposely concealed it, or that, if they did speak of it their account has been suppressed or changed

[1]Ps 2 1 2 Why do the heathen rage and the rulers of the earth against the Lord

in hurling no invectives against the persecutors and enemies of Jesus Christ For there is no such invective in any of the historians against Judas Pilate or any of the Jews

If this moderation of the writers of the Gospels had been assumed as well as many other traits of so beautiful a character and they had only assumed it to attract notice even if they had not dared to draw attention to it themselves they would not have failed to secure friends who would have made such remarks to their advantage But as they acted thus without pretence and from wholly disinterested motives they did not point it out to any one and I believe that many such facts have not been noticed till now which is evidence of the natural disinterestedness with which the thing has been done

799 An artisan who speaks of wealth a lawyer who speaks of war of royalty etc but the rich man rightly speaks of wealth a king speaks indifferently of a great gift he has just made and God rightly speaks of God

800 Who has taught the evangelists the qualities of a perfectly heroic soul that they paint it so perfectly in Jesus Christ? Why do they make Him weak in His agony? Do they not know how to paint a resolute death? Yes for the same Saint Luke paints the death of Saint Stephen as braver than that of Jesus Christ

They make Him therefore capable of fear before the necessity of dying has come and then altogether brave

But when they make Him so troubled it is when He afflicts Himself and when men afflict Him He is altogether strong

801 *Proof of Jesus Christ* —The supposition that the apostles were impostors is very absurd Let us think it out Let us imagine those twelve men assembled after the death of Jesus Christ plotting to say that He was risen By this they attack all the powers The heart of man is strangely inclined to fickleness to change to promises to gain However little any of them might have been led astray by all these attractions nay more by the fear of prisons tortures and death they were lost Let us follow up this thought

802 The apostles were either deceived or deceivers Either supposition has difficulties for it is not possible to mistake a man raised from the dead

While Jesus Christ was with them He could sustain them But after that if He did not appear to them who inspired them to act?

SECTION XIII

THE MIRACLES

803 *The beginning* —Miracles enable us to judge of doctrine and doctrine enables us to judge of miracles

There are false miracles and true There must be a distinction in order to know them otherwise they would be useless Now they are not useless on the contrary

they are fundamental Now the rule which is given to us must be such that it does not destroy the proof which the true miracles give of the truth, which is the chief end of the miracles

Moses has given two rules that the prediction does not come to pass (Deut 18), and that they do not lead to idolatry (Deut 13), and Jesus Christ one

If doctrine regulates miracles, miracles are useless for doctrine

If miracles regulate

Objection to the rule —The distinction of the times One rule during the time of Moses, another at present

804 *Miracle* —It is an effect, which exceeds the natural power of the means which are employed for it, and what is not a miracle is an effect, which does not exceed the natural power of the means which are employed for it Thus, those who heal by invocation of the devil do not work a miracle, for that does not exceed the natural power of the devil But

805 The two fundamentals, one inward, the other outward, grace and miracles, both supernatural

806 Miracles and truth are necessary, because it is necessary to convince the entire man, in body and soul

807 In all times, either men have spoken of the true God, or the true God has spoken to men

808 Jesus Christ has verified that He was the Messiah, never in verifying His doctrine by Scripture and the prophecies, but always by His miracles

He proves by a miracle that He remits sins

Rejoice not in your miracles, said Jesus Christ, *but because your names are written in heaven*

If they believe not Moses, neither will they believe one risen from the dead

Nicodemus recognises by His miracles that His teaching is of God *Scimus quia venisti a Deo magister, nemo enim potest hæc signa facere quæ tu facis nisi Deus fuerit cum eo* [1] He does not judge of the miracles by the teaching, but of the teaching by the miracles

The Jews had a doctrine of God as we have one of Jesus Christ and confirmed by miracles They were forbidden to believe every worker of miracles, and they were further commanded to have recourse to the chief priests and to rely on them

And thus, in regard to their prophets, they had all those reasons which we have for refusing to believe the workers of miracles

And yet they were very sinful in rejecting the prophets and Jesus Christ because of their miracles, and they would not have been culpable if they had not seen the miracles *Nisi fecissem ... peccatum non haberent* [2] Therefore all belief rests upon miracles

Prophecy is not called miracle, as Saint John speaks of the first miracle in Cana

[1] John 3 2 *We know that thou art a teacher come from God for no man can do these* miracles that thou doest except God be with him

[2] John 15 24 If I had not done ... they had not had sin.

and then of what Jesus Christ says to the woman of Samaria when He reveals to her all her hidden life Then He heals the centurion s son and Saint John calls this the second miracle

809 The combinations of miracles

810 The second miracle can suppose the first but the first cannot suppose the second

811 Had it not been for the miracles there would have been no sin in not believing in Jesus Christ

812 I should not be a Christian but for the miracles said Saint Augustine

813 *Miracles*—How I hate those who make men doubt of miracles! Montaigne speaks of them as he should in two places In one we see how careful he is and yet in the other he believes and makes sport of unbelievers

However it may be the Church is without proofs if they are right

814 Montaigne against miracles
Montaigne for miracles

815 It is not possible to have a reasonable belief against miracles

816 Unbelievers the most credulous They believe the miracles of Vespasian in order not to believe those of Moses

817 *Title How it happens that men believe so many liars who say that they have seen miracles and do not believe any of those who say that they have secrets to make men immortal or restore youth to them*—Having considered how it happens that so great credence is given to so many impostors who say they have remedies often to the length of men putting their lives into their hands it has appeared to me that the true cause is that there are true remedies For it would not be possible that there should be so many false remedies and that so much faith should be placed in them if there were none true If there had never been any remedy for any ill and all ills had been incurable it is impossible that men should have imagined that they could give remedies and still more impossible that so many others should have believed those who boasted of having remedies in the same way as did a man boast of preventing death no one would believe him because there is no example of this But as there were a number of remedies found to be true by the very knowledge of the greatest men the belief of men is thereby induced and this being known to be possible it has been therefore concluded that it was For people commonly reason thus A thing is possible therefore it is because the thing cannot be denied generally since there are particular effects which are true the people who cannot distinguish which among these particular effects are true believe them all In the same way the reason why so many false effects are credited to the moon is that there are some true as the tide

It is the same with prophecies miracles divination by dreams sorceries etc

For if there had been nothing true in all this, men would have believed nothing of them, and thus, instead of concluding that there are no true miracles because there are so many false, we must, on the contrary, say that there certainly are true miracles, since there are false, and that there are false miracles only because some are true We must reason in the same way about religion, for it would not be possible that men should have imagined so many false religions, if there had not been a true one The objection to this is that savages have a religion, but the answer is that they have heard the true spoken of, as appears by the Deluge, circumcision, the cross of Saint Andrew, etc

818 Having considered how it comes that there are so many false miracles, false revelations, sorceries, etc , it has seemed to me that the true cause is that there are some true, for it would not be possible that there should be so many false miracles, if there were none true, nor so many false revelations, if there were none true, nor so many false religions, if there were not one true For if there had never been all this, it is almost impossible that men should have imagined it, and still more impossible that so many others should have believed it But as there have been very great things true, and as they have been believed by great men, this impression has been the cause that nearly everybody is rendered capable of believing also the false And thus, instead of concluding that there are no true miracles, since there are so many false, it must be said, on the contrary, that there are true miracles, since there are so many false, and that there are false ones only because there are true, and that in the same way there are false religions because there is one true —Objection to this savages have a religion But this is because they have heard the true spoken of, as appears by the cross of Saint Andrew, the Deluge, circumcision, etc This arises from the fact that the human mind finding itself inclined to that side by the truth, becomes thereby susceptible of all the falsehoods of this

819 Jeremiah 23 32 The *miracles* of the false prophets In the Hebrew and Vatable they are the *tricks*

Miracle does not always signify miracle I Sam 14 15, *miracle* signifies *fear*, and is so in the Hebrew The same evidently in Job 33 7, and also Isaiah 21 4, Jeremiah 44 12 *Portentum* signifies *simulacrum*, Jeremiah 50 38, and it is so in the Hebrew and Vatable Isaiah 8 18 Jesus Christ says that He and His will be in *miracles*

820 If the devil favoured the doctrine which destroys him, he would be divided against himself, as Jesus Christ said If God favoured the doctrine which destroys the Church, He would be divided against Himself *Omne regnum divisum*[1] For Jesus Christ wrought against the devil and destroyed his power over the heart, of which exorcism is the symbolisation, in order to establish the kingdom of God And thus He adds, *Si in digito Dei ... regnum Dei ad vos*[2]

821 There is a great difference between tempting and leading into error God tempts but He does not lead into error To tempt is to afford opportunities,

[1]Matt 12 25 Luke 11 17 Every kingdom divided against itself
[2]Luke 11 20. If with the finger of God ... the kingdom of God is come upon you

which impose no necessity if men do not love God they will do a certain thing To lead into error is to place a man under the necessity of inferring and following out what is untrue

822 Abraham and Gideon are above revelation The Jews blinded themselves in judging of miracles by the Scripture God has never abandoned His true worshippers

I prefer to follow Jesus Christ than any other because He has miracle prophecy doctrine perpetuity etc

The Donatists No miracle which obliges them to say it is the devil

The more we particularise God Jesus Christ the Church

823 If there were no false miracles there would be certainty If there were no rule to judge of them miracles would be useless and there would be no reason for believing

Now there is humanly speaking no human certainty but we have reason

824 Either God has confounded the false miracles or He has foretold them and in both ways He has raised Himself above what is supernatural with respect to us and has raised us to it

825 Miracles serve not to convert but to condemn Part I II (Q 113 A 10 *Ad 2*)[1]

826 *Reasons why we do not believe*

John xii 37 *Cum autem tanta signa fecisset non credebant in eum ut sermo Isayæ impleretur Excæcavit*[2] etc

Hæc dixit Isaias quando vidit gloriam ejus et locutus est de eo[3]

Judæi signa petunt et Græci sapientiam quærunt nos autem Jesum crucifixum[4] (*Sed plenum signis sed plenum sapientia vos autem Christum non crucifixum et religionem sine miraculis et sine sapientia*)[5]

What makes us not believe in the true miracles is want of love John *Sed vos non creditis quia non estis ex ovibus*[6] What makes us believe the false is want of love II Thess 2

The foundation of religion It is the miracles What then? Does God speak against miracles against the foundations of the faith which we have in Him?

If there is a God faith in God must exist on earth Now the miracles of Jesus Christ are not foretold by Antichrist but the miracles of Antichrist are foretold by Jesus Christ And so if Jesus Christ were not the Messiah He would have indeed led into error When Jesus Christ foretold the miracles of Antichrist did He think of destroying faith in His own miracles?

[1] St Thomas Aquinas *Summa Theologica*

[2] But though he had done so many miracles before them yet they believed not on him that the saying of Esaias the prophet might be fulfilled He hath blinded their eyes

[3] John 12 41 These things said Esaias when he saw his glory and spake of him

[4] I Cor 1 22 23 For the Jews require a sign and the Greeks seek after wisdom but we preach Christ crucified.

[5] But full of signs full of wisdom you [the Jesuits] what you wish is a Christ not crucified a religion without miracles and without wisdom

[6] 10.26 But ye believe not because ye are not of my sheep

Moses foretold Jesus Christ and bade to follow Him Jesus Christ foretold Antichrist and forbade to follow him

It was impossible that in the time of Moses men should keep their faith for Antichrist, who was unknown to them But it is quite easy, in the time of Antichrist, to believe in Jesus Christ, already known

There is no reason for believing in Antichrist, which there is not for believing in Jesus Christ But there are reasons for believing in Jesus Christ, which there are not for believing in the other

827 Judges 13 23 "If the Lord were pleased to kill us, He would not have shewed us all these things"

Hezekiah, Sennacherib

Jeremiah Hananiah, the false prophet, dies in seven months

II Macc 3 The temple, ready for pillage, miraculously succoured —II Macc 15

I Kings 17 The widow to Elijah, who had restored her son, 'By this I know that thy words are true'

I Kings 18 Elijah with the prophets of Baal

In the dispute concerning the true God and the truth of religion, there has never happened any miracle on the side of error, and not of truth

828 *Opposition* —Abel, Cain, Moses, the Magicians, Elijah, the false prophets Jeremiah, Hananiah, Micaiah, the false prophets, Jesus Christ, the Pharisees, Saint Paul, Bar jesus, the Apostles, the Exorcists, Christians, unbelievers, Catholics, heretics, Elijah, Enoch, Antichrist

829 Jesus Christ says that the Scriptures testify of Him But He does not point out in what respect

Even the prophecies could not prove Jesus Christ during His life, and so men would not have been culpable for not believing in Him before His death had the miracles not sufficed without doctrine Now those who did not believe in Him, when He was still alive, were sinners, as He said Himself, and without excuse Therefore they must have had proof beyond doubt, which they resisted Now, they had not the prophecies, but only the miracles Therefore the latter suffice, when the doctrine is not inconsistent with them, and they ought to be believed

John 7 40 *Dispute among the Jews as among the Christians of to day* Some believed in Jesus Christ, others believed Him not, because of the prophecies which said that He should be born in Bethlehem They should have considered more carefully whether He was not For His miracles being convincing they should have been quite sure of these supposed contradictions of His teaching to Scripture, and this obscurity did not excuse but blinded them Thus those who refuse to believe in the miracles in the present day on account of a supposed contradiction, which is unreal, are not excused

The Pharisees said to the people, who believed in Him, because of His miracles This people who knoweth not the law are cursed But have any of the rulers or of the Pharisees believed in him? For we know that out of Galilee ariseth no prophet Nicodemus answered Doth our law judge any man before it hear him [and specially such a man who works such miracles] ?

830 The prophecies were ambiguous they are no longer so

831 The five propositions were ambiguous they are no longer so

83 Miracles are no longer necessary because we have had them already But when tradition is no longer minded when the Pope alone is offered to us when he has been imposed upon and when the true source of truth which is tradition is thus excluded and the Pope who is its guardian is biased the truth is no longer free to appear Then as men speak no longer of truth truth itself must speak to men This is what happened in the time of Arius (Miracles under Dio cletian and under Arius)

833 *Miracle* —The people concluded this of themselves but if the reason of it must be given to you

It is unfortunate to be in exception to the rule The same must be strict and opposed to exception But yet as it is certain that there are exceptions to a rule our judgment must though strict be just

834 John 6 26 *Non quia vidisti signum sed quia saturati estis* [1]

Those who follow Jesus Christ because of His miracles honour His power in all the miracles which it produces But those who making profession to follow Him because of His miracles follow Him in fact only because He comforts them and satisfies them with worldly blessings discredit His miracles when they are op posed to their own comforts

John 9 *Non est hic homo a Deo quia sabbatum non custodit Alii Quomodo potest homo peccator h ec signa f icere?* [2]

Which is the most clear?

This house is not of God for they do not there believe that the five proposi tions are in Jansenius Others This house is of God for in it there are wrought strange miracles

Which is the most clear?

Tu quid dicis? Dico quia propheta est Nisi esset hic a Deo non poterat facere quidquam [3]

835 In the Old Testament when they will turn you from God In the New when they will turn you from Jesus Christ These are the occasions for excluding particular miracles from belief No others need be excluded

Does it therefore follow that they would have the right to exclude all the prophets who came to them? No they would have sinned in not excluding those who denied God and would have sinned in excluding those who did not deny God

So soon then as we see a miracle we must either assent to it or have striking proofs to the contrary We must see if it denies a God or Jesus Christ or the Church

836 There is a great difference between not being for Jesus Christ and saying

[1] Not because ye saw the miracles but because ye were filled

[2] 16 This man is not of God because he keepeth not the Sabbath day Others said How can a man that is a sinner do such miracles

[3] John 9 17 33 What sayest thou of him? He said He is a prophet If this man were not of God he could do nothing

so, and not being for Jesus Christ and pretending to be so. The one party can do miracles, not the others. For it is clear of the one party that they are opposed to the truth, but not of the others, and thus miracles are clearer.

837. That we must love one God only is a thing so evident that it does not require miracles to prove it.

838. Jesus Christ performed miracles, then the apostles, and the first saints in great number, because the prophecies not being yet accomplished, but in the process of being accomplished by them, the miracles alone bore witness to them. It was foretold that the Messiah should convert the nations. How could this prophecy be fulfilled without the conversion of the nations? And how could the nations be converted to the Messiah, if they did not see this final effect of the prophecies which prove Him? Therefore, till He had died, risen again, and converted the nations, all was not accomplished, and so miracles were needed during all this time. Now they are no longer needed against the Jews, for the accomplished prophecies constitute a lasting miracle.

839. 'Though ye believe not Me, believe at least the works. He refers them, as it were, to the strongest proof.

It had been told to the Jews, as well as to Christians, that they should not always believe the prophets, but yet the Pharisees and Scribes are greatly concerned about His miracles and try to show that they are false, or wrought by the devil. For they must needs be convinced, if they acknowledge that they are of God.

At the present day we are not troubled to make this distinction. Still it is very easy to do: those who deny neither God nor Jesus Christ do no miracles which are not certain. *Nemo facit virtutem in nomine meo, et cito possit de me male loqui.*[1]

But we have not to draw this distinction. Here is a sacred relic. Here is a thorn from the crown of the Saviour of the world, over whom the prince of this world has no power, which works miracles by the peculiar power of the blood shed for us. Now God Himself chooses this house in order to display conspicuously therein His power.

These are not men who do miracles by an unknown and doubtful virtue, which makes a decision difficult for us. It is God Himself. It is the instrument of the Passion of His only Son, who, being in many places, chooses this and makes men come from all quarters there to receive these miraculous alleviations in their weaknesses.

840. The Church has three kinds of enemies: the Jews, who have never been of her body; the heretics, who have withdrawn from it; and the evil Christians, who rend her from within.

These three kinds of different adversaries usually attack her in different ways. But here they attack her in one and the same way. As they are all without miracles, and as the Church has always had miracles against them, they have all had the same interest in evading them, and they all make use of this excuse: that doctrine must not be judged by miracles, but miracles by doctrine. There were two parties

[1] Mark ix. 39. *Nemo est enim qui faciat.* "There is no man which shall do a miracle in my name that can lightly speak evil of me."

among those who heard Jesus Christ those who followed His teaching on account of His miracles others who said There were two parties in the time of Calvin There are now the Jesuits etc

841 Miracles furnish the test in matters of doubt between Jews and heathens Jews and Christians Catholics and heretics the slandered and slanderers between the two crosses

But miracles would be useless to heretics for the Church authorised by miracles which have already obtained belief tells us that they have not the true faith There is no doubt that they are not in it since the first miracles of the Church exclude belief of theirs Thus there is miracle against miracle both the first and greatest being on the side of the Church

These nuns astonished at what is said—that they are in the way of perdition that their confessors are leading them to Geneva that they suggest to them that Jesus Christ is not in the Eucharist nor on the right hand of the Father—know that all this is false and therefore offer themselves to God in this state *Vide si via iniquitatis in me est* [1] What happens thereupon? This place which is said to be the temple of the devil God makes His own temple It is said that the children must be taken away from it God heals them there It is said that it is the arsenal of hell God makes of it the sanctuary of His grace Lastly they are threatened with all the fury and vengeance of heaven and God overwhelms them with favours A man would need to have lost his senses to conclude from this that they are therefore in the way of perdition

(We have without doubt the same signs as Saint Athanasius)

842 *Si tu es Christus dic nobis* [2]

Opera quæ ego facio in nomine patris mei hæc testimonium perhibent de me Sed vos non creditis quia non estis ex ovibus meis Oves meæ vocem meam audiunt [3]

John 6 30 *Quod ergo tu facis signum ut videamus et credamus tibi?* (*Non dicunt Quam doctrinam prædicas?*)[4]

Nemo potest facere signa quæ tu facis nisi Deus [5]

II Macc 14 15 *Deus qui signis evidentibus suam portionem protegit* [6]

Volumus signum videre de cœlo tentantes eum [7] Luke 11 16

Generatio prava signum quærit et non dabitur [8]

Et ingemiscens ait Quid generatio ista signum quærit? [9] (Mark 8 12) They asked a sign with an evil intention

Et non poterat facere [10] And yet he promises them the sign of Jonah the great and wonderful miracle of his resurrection

[1] Ps 138 24 And see if there be any wicked way in me
[2] Luke 22 66 Art thou the Christ? tell us
[3] John 5 36 The works which the father hath given me to finish bear witness of me John 10 26 27 But ye believe not because ye are not of my sheep My sheep hear my voice
[4] What sign shewest thou then that we may see and believe thee (They do not say What doctrine do you preach?)
[5] John 3 2 No man can do these miracles that thou doest except God be with him
[6] The Lord making manifest his presence upholdeth them that are his own portion
[7] And others tempting him sought of him a sign from heaven
[8] Matt 12 39 An evil generation seeketh after a sign and there shall no sign be given to it
[9] And he sighed deeply in his spirit and saith why doth this generation seek after a sign?
[10] Mark 6 5 And he could there do no mighty work

Nisi videritis, non creditis[1] He does not blame them for not believing unless there are miracles, but for not believing unless they are themselves spectators of them

Antichrist *in signis mendacibus*,[2] says Saint Paul, II Thess 2

Secundum operationem Satanæ, in seductione iis qui pereunt eo quod charitatem veritatis non receperunt ut salvi fierent, ideo mittet illis Deus optationes erroris ut credant mendacio[3]

As in the passage of Moses *Tentat enim vos Deus, utrum diligatis eum*[4]

Ecce prædixi vobis vos ergo videte[5]

843 Here is not the country of truth She wanders unknown amongst men God has covered her with a veil, which leaves her unrecognised by those who do not hear her voice Room is opened for blasphemy, even against the truths that are at least very likely If the truths of the Gospel are published, the contrary is published too, and the questions are obscured, so that the people cannot distinguish And they ask, "What have you to make you believed rather than others? What sign do you give? You have only words, and so have we If you had miracles, good and well That doctrine ought to be supported by miracles is a truth, which they misuse in order to revile doctrine And if miracles happen, it is said that miracles are not enough without doctrine, and this is another truth, which they misuse in order to revile miracles

Jesus Christ cured the man born blind and performed a number of miracles on the Sabbath day In this way He blinded the Pharisees, who said that miracles must be judged by doctrine

We have Moses but, as for this fellow, we know not from whence he is It is wonderful that you know not whence He is, and yet He does such miracles

Jesus Christ spoke neither against God, nor against Moses

Antichrist and the false prophets, foretold by both Testaments, will speak openly against God and against Jesus Christ Who is not hidden God would not allow him, who would be a secret enemy, to do miracles openly

In a public dispute where the two parties profess to be for God, for Jesus Christ, for the Church, miracles have never been on the side of the false Christians, and the other side has never been without a miracle

'He hath a devil John 10 21 And others said,' Can a devil open the eyes of the blind?

The proofs which Jesus Christ and the apostles draw from Scripture are not conclusive, for they say only that Moses foretold that a prophet should come But they do not thereby prove that this is He, and that is the whole question These passages therefore serve only to show that they are not contrary to Scripture and that there appears no inconsistency but not that there is agreement Now this is enough, namely, exclusion of inconsistency, along with miracles

[1]John 4 48 Except ye see ye will not believe

[2]9 In signs and lying wonders

[3]II Thess 2 9 11 After the working of Satan and with all deceivableness of unrighteousness in them that perish because they received not the love of the truth that they might be saved And for this cause God shall send them strong delusion that they should believe a lie

[4]Deut. 13 3 for the Lord your God proveth you to know whether ye love the Lord

[5]Matt 24 25 26 Behold I have told you before Wherefore if they shall say unto you, Behold

There is a mutual duty between God and men We must pardon Him this saying *Quid debui?*[1] Accuse me said God in Isaiah

God must fulfil His promises etc

Men owe it to God to accept the religion which He sends God owes it to men not to lead them into error Now they would be led into error if the workers of miracles announced a doctrine which should not appear evidently false to the light of common sense and if a greater worker of miracles had not already warned men not to believe them

Thus if there were divisions in the Church and the Arians for example who declared themselves founded on Scripture just as the Catholics had done miracles and not the Catholics men should have been led into error

For as a man who announces to us the secrets of God is not worthy to be believed on his private authority and that is why the ungodly doubt him so when a man as a token of the communion which he has with God raises the dead foretells the future removes the seas heals the sick there is none so wicked as not to bow to him and the incredulity of Pharaoh and the Pharisees is the effect of a supernatural obduracy

When therefore we see miracles and a doctrine not suspicious both on one side there is no difficulty But when we see miracles and suspicious doctrine on the same side we must then see which is the clearest Jesus Christ was suspected

Bar jesus blinded The power of God surpasses that of His enemies

The Jewish exorcists beaten by the devils saying Jesus I know and Paul I know but who are ye ?

Miracles are for doctrine and not doctrine for miracles

If the miracles are true shall we be able to persuade men of all doctrine? No for this will not come to pass *Si angelus*

Rule we must judge of doctrine by miracles we must judge of miracles by doctrine All this is true but contains no contradiction

For we must distinguish the times

How glad you are to know the general rules thinking thereby to set up dissension and render all useless![2] We shall prevent you my father truth is one and constant

It is impossible from the duty of God to men that a man hiding his evil teaching and only showing the good saying that he conforms to God and the Church should do miracles so as to instil insensibly a false and subtle doctrine This cannot happen

And still less that God who knows the heart should perform miracles in favour of such a one

844 The three marks of religion perpetuity a good life miracles They destroy perpetuity by their doctrine of probability a good life by their morals miracles by destroying either their truth or the conclusions to be drawn from them

If we believe them the Church will have nothing to do with perpetuity holiness and miracles The heretics deny them or deny the conclusions to be drawn from them they do the same But one would need to have no sincerity in order

[1]Is 5 4 *Quid est quod debui ultra facere vineæ meæ et non feci ei?* What could have been done more to my vineyard that I have not done in it?

[2]Gal 1 8 But though an angel

to deny them, or again to lose one's senses in order to deny the conclusions to be drawn from them

Nobody has ever suffered martyrdom for the miracles which he says he has seen, for the folly of men goes perhaps to the length of martyrdom, for those which the Turks believe by tradition, but not for those which they have seen

845 The heretics have always attacked these three marks, which they have not

846 *First objection* 'An angel from heaven We must not judge of truth by miracles, but of miracles by truth Therefore the miracles are useless

Now they are of use, and they must not be in opposition to the truth Therefore what Father Lingende has said that God will not permit that a miracle may lead into error "

When there shall be a controversy in the same Church, miracle will decide

Second objection But Antichrist will do miracles

The magicians of Pharaoh did not entice to error Thus we cannot say to Jesus respecting Antichrist, You have led me into error ' For Antichrist will do them against Jesus Christ, and so they cannot lead into error Either God will not permit false miracles, or He will procure greater

[Jesus Christ has existed since the beginning of the world this is more impressive than all the miracles of Antichrist]

If in the same Church there should happen a miracle on the side of those in error, men would be led into error Schism is visible, a miracle is visible But schism is more a sign of error than a miracle is a sign of truth Therefore a miracle cannot lead into error

But, apart from schism, error is not so obvious as a miracle is obvious Therefore a miracle could lead into error

Ubi est Deus tuus?[1] Miracles show Him and are a light

847 One of the anthems for Vespers at Christmas *Exortum est in tenebris lumen rectis corde*[2]

848 If the compassion of God is so great that He instructs us to our benefit, even when He hides Himself, what light ought we not to expect from Him when He reveals Himself?

849 Will *Est et non est*[3] be received in faith itself as well as in miracles? And if it is inseparable in the others

When Saint Xavier works miracles [Saint Hilary Ye wretches who oblige us to speak of miracles]

Unjust judges, make not your own laws on the moment judge by those which are established and by yourselves *Vae qui condunt leges iniquas*[4]

Miracles endless, false

In order to weaken your adversaries, you disarm the whole Church

[1] Ps 41 4 Where is thy God?
[2] Ps 111 4 Unto the upright there ariseth light in the darkness
[3] The yes and the no
[4] Is 10 1 Woe unto them that decree unrighteous decrees

If they say that our salvation depends upon God they are heretics If they say that they are obedient to the Pope that is hypocrisy If they are ready to subscribe to all the articles that is not enough If they say that a man must not be killed for an apple they attack the morality of Catholics If miracles are done among them it is not a sign of holiness and is on the contrary a symptom of heresy

This way in which the Church has existed is that truth has been without dispute or if it has been contested there has been the Pope or failing him there has been the Church

850 The five propositions condemned but no miracle for the truth was not attacked But the Sorbonne but the bull

It is impossible that those who love God with all their heart should fail to recognise the Church so evident is she It is impossible that those who do not love God should be convinced of the Church

Miracles have such influence that it was necessary that God should warn men not to believe in them in opposition to Him all clear as it is that there is a God Without this they would have been able to disturb men

And thus so far from these passages Deut 13 making against the authority of the miracles nothing more indicates their influence And the same in respect of Antichrist To seduce if it were possible even the elect

851 The history of the man born blind

What says Saint Paul? Does he continually speak of the evidence of the prophecies? No but of his own miracle What says Jesus Christ? Does He speak of the evidence of the prophecies? No His death had not fulfilled them But he says *Si non fecissem* [1] Believe the works

Two supernatural foundations of our wholly supernatural religion one visible the other invisible miracles with grace miracles without grace

The synagogue which had been treated with love as a type of the Church and with hatred because it was only the type has been restored being on the point of falling when it was well with God and thus a type

Miracles prove the power which God has over hearts by that which He exercises over bodies

The Church has never approved a miracle among heretics

Miracles a support of religion they have been the test of Jews they have been the test of Christians saints innocents and true believers

A miracle among schismatics is not so much to be feared for schism which is more obvious than a miracle visibly indicates their error But when there is no schism and error is in question miracle decides

Si non fecissem quæ alius non fecit [2] The wretches who have obliged us to speak of miracles

Abraham and Gideon confirm faith by miracles

Judith God speaks at last in their greatest oppression

If the cooling of love leaves the Church almost without believers miracles will rouse them This is one of the last effects of grace

If one miracle were wrought among the Jesuits!

[1] John 15 24 If he had not done
[2] John 15 24 If he had not done among them the works which none other man did

When a miracle disappoints the expectation of those in whose presence it happens, and there is a disproportion between the state of their faith and the instrument of the miracle, it ought then to induce them to change But with you it is otherwise There would be as much reason in saying that, if the Eucharist raised a dead man, it would be necessary for one to turn a Calvinist rather than remain a Catholic But when it crowns the expectation, and those, who hoped that God would bless the remedies, see themselves healed without remedies

The ungodly —No sign has ever happened on the part of the devil without a stronger sign on the part of God, or even without it having been foretold that such would happen

852 Unjust persecutors of those whom God visibly protects If they reproach you with your excesses, they speak as the heretics If they say that the grace of Jesus Christ distinguishes us, they are heretics If they do miracles, it is the mark of their heresy

Ezekiel They say These are the people of God who speak thus

It is said, Believe in the Church , but it is not said Believe in miracles , because the last is natural, and not the first The one had need of a precept, not the other Hezekiah

The synagogue was only a type, and thus it did not perish, and it was only a type, and so it is decayed It was a type which contained the truth, and thus it has lasted until it no longer contained the truth

My reverend father, all this happened in types Other religions perish, this one perishes not

Miracles are more important than you think They have served for the foundation, and will serve for the continuation of the Church till Antichrist, till the end

The two witnesses

In the Old Testament and the New, miracles are performed in connection with types Salvation or a useless thing, if not to show that we must submit to the Scriptures type of the sacrament

853 [We must judge soberly of divine ordinances, my father Saint Paul in the isle of Malta]

854 The hardness of the Jesuits, then, surpasses that of the Jews, since those refused to believe Jesus Christ innocent only because they doubted if His miracles were of God Whereas the Jesuits though unable to doubt that the miracles of Port Royal are of God do not cease to doubt still the innocence of that house

855 I suppose that men believe miracles You corrupt religion either in favour of your friends or against your enemies You arrange it at your will

856 *Or the miracle* —As God has made no family more happy let it also be the case that He find none more thankful

SECTION XIV

APPENDIX POLEMICAL FRAGMENTS

857 *Clearness obscurity*—There would be too great darkness if truth had not visible signs This is a wonderful one that it has always been preserved in one Church and one visible assembly [of men] There would be too great clearness if there were only one opinion in this Church But in order to recognise what is true one has only to look at what has always existed for it is certain that truth has always existed and that nothing false has always existed

858 The history of the Church ought properly to be called the history of truth

859 There is a pleasure in being in a ship beaten about by a storm when we are sure that it will not founder The persecutions which harass the Church are of this nature

860 In addition to so many other signs of piety they are also persecuted which is the best sign of piety

861 The Church is in an excellent state when it is sustained by God only

862 The Church has always been attacked by opposite errors but perhaps never at the same time as now And if she suffer more because of the multiplicity of errors she derives this advantage from it that they destroy each other

She complains of both but far more of the Calvinists because of the schism

It is certain that many of the two opposite sects are deceived They must be disillusioned

Faith embraces many truths which seem to contradict each other *There is a time to laugh and a time to weep* etc *Responde Ne respondeas*[1] etc

The source of this is the union of the two natures in Jesus Christ and also the two worlds (the creation of a new heaven and a new earth a new life and a new death all things double and the same names remaining) and finally the two natures that are in the righteous (for they are the two worlds and a member and image of Jesus Christ And thus all the names suit them righteous yet sinners dead yet living living yet dead elect yet outcast etc)

There are then a great number of truths both of faith and of morality which *seem contradictory and which all hold good together in a wonderful system* The source of all heresies is the exclusion of some of these truths and the source of all the objections which the heretics make against us is the ignorance of some of our truths And it generally happens that unable to conceive the connection of two opposite truths and believing that the admission of one involves the exclusion of the other they adhere to the one exclude the other and think of us as opposed to them Now exclusion is the cause of their heresy and ignorance that we hold the other truth causes their objections

[1]Prov 26 4 5 Answer Answer not.

1st example Jesus Christ is God and man The Arians, unable to reconcile these things, which they believe incompatible, say that He is man, in this they are Catholics But they deny that He is God, in this they are heretics They allege that we deny His humanity, in this they are ignorant

2nd example On the subject of the Holy Sacrament We believe that, the substance of the bread being changed, and being consubstantial with that of the body of our Lord, Jesus Christ is therein really present That is one truth Another is that this Sacrament is also a type of the cross and of glory, and a commemoration of the two That is the Catholic faith, which comprehends these two truths which seem opposed

The heresy of to day, not conceiving that this Sacrament contains at the same *time both the presence of Jesus Christ and a type of Him, and that it is a sacrifice* and a commemoration of a sacrifice, believes that neither of these truths can be admitted without excluding the other for this reason

They fasten to this point alone, that this Sacrament is typical, and in this they are not heretics They think that we exclude this truth, hence it comes that they raise so many objections to us out of the passages of the Fathers which assert it Finally, they deny the presence, and in this they are heretics

3rd example Indulgences

The shortest way, therefore, to prevent heresies is to instruct in all truths, and the surest way to refute them is to declare them all For what will the heretics say?

In order to know whether an opinion is a Father s

863 All err the more dangerously, as they each follow a truth Their fault is not in following a falsehood, but in not following another truth

864 Truth is so obscure in these times, and *falsehood so established* that, unless we love the truth, we cannot know it

865 If there is ever a time in which we must make profession of two opposite truths, it is when we are reproached for omitting one Therefore the Jesuits and Jansenists are wrong in concealing them, but the Jansenists more so, for the Jesuits have better made profession of the two

866 Two kinds of people make things equal to one another, as feasts to working days Christians to priests, all things among them etc And hence the one party conclude that what is then bad for priests is also so for Christians and the other that what is not bad for Christians is lawful for priests

867 If the ancient Church was in error the Church is fallen If she should be in error to day, it is not the same thing, for she has always the superior maxim of *tradition from the hand of the ancient Church, and so this submission and this* conformity to the ancient Church prevail and correct all But the ancient Church did not assume the future Church and did not consider her, as we assume and consider the ancient

868 That which hinders us in comparing what formerly occurred in the Church with what we see there now is that we generally look upon Saint Athanasius,

Saint Theresa and the rest as crowned with glory and acting towards us as gods Now that time has cleared up things it does so appear But at the time when he was persecuted this great saint was a man called Athanasius and Saint Theresa was a nun Elias was a man subject to like passions as we are says Saint James to disabuse Christians of that false idea which makes us reject the example of the saints as disproportioned to our state They were saints say we they are not like us What then actually happened? Saint Athanasius was a man called Athanasius accused of many crimes condemned by such and such a council for such and such a crime All the bishops assented to it and finally the Pope What said they to those who opposed this? That they disturbed the peace that they created schism etc

Zeal light Four kinds of persons zeal without knowledge knowledge with out zeal neither knowledge nor zeal both zeal and knowledge The first three condemned him The last acquitted him were excommunicated by the Church and yet saved the Church

869 If Saint Augustine came at the present time and was as little authorised as his defenders he would accomplish nothing God directs His Church well by having sent him before with authority

870 God has not wanted to absolve without the Church As she has part in the offence He desires her to have part in the pardon He associates her with this power as kings their parliaments But if she absolves or binds without God, she is no longer the Church For as in the case of parliament even if the king have pardoned a man it must be ratified but if parliament ratifies without the king or refuses to ratify on the order of the king it is no longer the parliament of the king but a rebellious assembly

871 *The Church the Pope Unity plurality*—Considering the Church as a unity the Pope who is its head is as the whole Considering it as a plurality the Pope is only a part of it The Fathers have considered the Church now in the one way now in the other And thus they have spoken differently of the Pope (Saint Cyprian *Sacerdos Dei*)[1] But in establishing one of these truths they have not excluded the other Plurality which is not reduced to unity is confusion unity which does not depend on plurality is tyranny There is scarcely any other country than France in which it is permissible to say that the Council is above the Pope

872 The Pope is head Who else is known of all? Who else is recognised by all having power to insinuate himself into all the body because he holds the princi pal shoot which insinuates itself everywhere? How easy it was to make this de generate into tyranny! That is why Christ has laid down for them this precept *Vos autem non sic*[2]

873 The Pope hates and fears the learned who do not submit to him at will

874 We must not judge of what the Pope is by some words of the Fathers—as

[1]Epistle 63 Priest of the Lord
[2]Luke 22 26 "But ye shall not be so

the Greeks said in a council, important rules—but by the acts of the Church and the Fathers, and by the canons

Duo[1] *aut tres*[2] *In unum* Unity and plurality It is an error to exclude one of the two, as the papists do who exclude plurality, or the Huguenots who exclude unity

875 Would the Pope be dishonoured by having his knowledge from God and tradition, and is it not dishonouring him to separate him from this holy union?

876 God does not perform miracles in the ordinary conduct of His Church It would be a strange miracle if infallibility existed in one man But it appears so natural for it to reside in a multitude, since the conduct of God is hidden under nature, as in all His other works

877 Kings dispose of their own power, but the Popes cannot dispose of theirs

878 *Summum jus, summa injuria*[3]

The majority is the best way, because it is visible and has strength to make itself obeyed Yet it is the opinion of the least able

If men could have done it, they would have placed might in the hands of justice But as might does not allow itself to be managed as men want, because it is a palpable quality, whereas justice is a spiritual quality of which men dispose as they please, they have placed justice in the hands of might And thus that is called just which men are forced to obey

Hence comes the right of the sword, for the sword gives a true right Otherwise we should see violence on one side and justice on the other (end of the twelfth *Provincial Letter*) Hence comes the injustice of the Fronde, which raises its alleged justice against power It is not the same in the Church, for there is a true justice and no violence

879 *Injustice* —Jurisdiction is not given for the sake of the judge, but for that of the litigant It is dangerous to tell this to the people But the people have too much faith in you, it will not harm them and may serve you It should therefore, be made known *Pasce oves meas*, not *tuas*[4] You owe me pasturage

880 Men like certainty They like the Pope to be infallible in faith, and grave doctors to be infallible in morals so as to have certainty

881 The Church teaches and God inspires both infallibly The work of the Church is of use only as a preparation for grace or condemnation What it does is enough for condemnation not for inspiration

882 Every time the Jesuits may impose upon the Pope, they will make all Christendom perjured

[1] John 10 30 I and my father are one
[2] I John 5 7 And these three agree in one
[3] The strictest law is the greatest injustice Terence *Heautontimorumenos* iv 5 47 and Cicero *De Officiis* i 10
[4] John 21 17 Feed my sheep Not yours

The Pope is very easily imposed upon because of his occupations and the confidence which he has in the Jesuits and the Jesuits are very capable of imposing upon him by means of calumny

883 The wretches who have obliged me to speak of the basis of religion

884 Sinners purified without penitence the righteous justified without love all Christians without the grace of Jesus Christ God without power over the will of men a predestination without mystery a redemption without certitude!

885 Any one is made a priest who wants to be so as under Jeroboam

It is a horrible thing that they propound to us the discipline of the Church of to day as so good that it is made a crime to desire to change it Formerly it was infallibly good and it was thought that it could be changed without sin and now such as it is we cannot wish it changed! It has indeed been permitted to change the custom of not making priests without such great circumspection that there were hardly any who were worthy and it is not allowed to complain of the custom which makes so many who are unworthy!

886 *Heretics*—Ezekiel All the heathen and also the Prophet spoke evil of Israel But the Israelites were so far from having the right to say to him You speak like the heathen that he is most forcible upon this that the heathen say the same as he

887 The Jansenists are like the heretics in the reformation of morality but you are like them in evil

888 You are ignorant of the prophecies if you do not know that all this must happen princes prophets Pope and even the priests And y t the Church is to abide By the grace of God we have not come to that Woe to these priests! But we hope that God will bestow His mercy upon us that we shall not be of them

Saint Peter Epistle ii false prophets in the past the image of future ones

889 So that if it is true on the one hand that some lax monks and some corrupt casuists who are not members of the hierarchy are steeped in these corruptions it is on the other hand certain that the true pastors of the Church who are the true guardians of the Divine Word have preserved it unchangeably against the efforts of those who have attempted to destroy it

And thus true believers have no pretext to follow that laxity which is only *offered to them by the strange hands of these casuists instead of the sound doc*trine which is presented to them by the fatherly hands of their own pastors And the ungodly and heretics have no ground for publishing these abuses as evidence of imperfection in the providence of God over His Church since the Church consisting properly in the body of the hierarchy we are so far from being able to conclude from the present state of matters that God has abandoned her to corruption that it has never been more apparent than at the present time that God visibly protects her from corruption

For if some of these men who by an extraordinary vocation have made pro

fession of withdrawing from the world and adopting the monks' dress, in order to live in a more perfect state than ordinary Christians, have fallen into excesses which horrify ordinary Christians, and have become to us what the false prophets were among the Jews, this is a private and personal misfortune, which must indeed be deplored, but *from which nothing can be inferred against the care which* God takes of His Church, since all these things are so clearly foretold, and it has been so long since announced that these temptations would arise from people of this kind, so that when we are well instructed, we see in this rather evidence of the care of God than of His forgetfulness in regard to us

890 Tertullian *Nunquam Ecclesia reformabitur*[1]

891 Heretics, who take advantage of the doctrine of the Jesuits, must be made to know that it is not that of the Church, and that our divisions do not separate us from the altar

892 If in differing we condemned, you would be right Uniformity without diversity is useless to others, diversity without uniformity is ruinous for us The one is harmful outwardly, the other inwardly

893 By showing the truth, we cause it to be believed, but by showing the injustice of ministers, we do not correct it Our mind is assured by a proof of falsehood, our purse is not made secure by proof of injustice

894 Those who love the Church lament to see the corruption of morals, but laws at least exist But these *corrupt* the laws The model is damaged

895 Men never do evil so completely and cheerfully as when they do it from religious conviction

896 It is in vain that the Church has established these words, anathemas, heresies, etc They are used against her

897 The servant knoweth not what his lord doeth, for the master tells him only the act and not the intention And this is why he often obeys slavishly, and defeats the *intention* But Jesus Christ has told us the object And you defeat that object

898 They cannot have perpetuity, and they seek universality, and therefore they make the whole Church corrupt that they may be saints

899 *Against those who misuse passages of Scripture and who pride themselves in finding one which seems to favour their error*—The chapter for Vespers, Passion Sunday, the prayer for the king

Explanation of these words He that is not with me is against me And of these others He that is not against you is for you A person who says I am neither for nor against we ought to reply to him

[1] The Church will never be reformed

900 He who will give the meaning of Scripture and does not take it from Scripture is an enemy of Scripture (St Augustine *Of Christian Doctrine*)

901 *Humilibus dat gratiam* [1] *an ideo non dedit humilitatem?* [2]
Sui eum non receperunt quotquot autem non receperunt [3] *an non erant sui?* [4]

902 It must indeed be says Feuillant that this is not so certain for controversy indicates uncertainty (Saint Athanasius Saint Chrysostom morals unbelievers)

The Jesuits have not made the truth uncertain but they have made their own ungodliness certain

Contradiction has always been permitted in order to blind the wicked for all that offends truth or love is evil This is the true principle

903 All religions and sects in the world have had natural reason for a guide Christians alone have been constrained to take their rules from without themselves and to acquaint themselves with those which Jesus Christ bequeathed to men of old to be handed down to true believers This constraint wearies these good Fathers They desire like other people to have liberty to follow their own imaginations It is in vain that we cry to them as the prophets said to the Jews of old Enter into the Church acquaint yourselves with the precepts which the men of old left to her and follow those paths They have answered like the Jews We will not walk in them but we will follow the thoughts of our hearts and they have said We will be as the other nations

904 They make a rule of exception

Have the men of old given absolution before penance? Do this as exceptional But of the exception you make a rule without exception so that you do not even want the rule to be exceptional

905 *On confessions and absolutions without signs of regret*

God regards only the inward the Church judges only by the outward God absolves as soon as He sees penitence in the heart the Church when she sees it in works God will make a Church pure within which confounds by its inward and entirely spiritual holiness the inward impiety of proud sages and Pharisees and the Church will make an assembly of men whose external manners are so pure as to confound the manners of the heathen If there are hypocrites among them but so well disguised that she does not discover their venom she tolerates them for though they are not accepted of God whom they cannot deceive they are of men whom they do deceive And thus she is not dishonoured by their conduct which appears holy But you want the Church to judge neither of the inward because that belongs to God alone nor of the outward because God dwells only upon the inward and thus taking away from her all choice of men you retain in the Church the most dissolute and those who dishonour her so greatly that the

[1] Jas 4 6 God giveth grace unto the humble
[2] But did he not give them humility?
[3] John 1 11 12 The world knew him not and his own received him not
[4] And were they not his?

synagogues of the Jews and sects of philosophers would have banished them as unworthy and have abhorred them as impious

906 The easiest conditions to live in according to the world are the most difficult to live in according to God, and vice versa Nothing is so difficult according to the world as the religious life, nothing is easier than to live it according to God Nothing is easier, according to the world, than to live in high office and great wealth, *nothing is more difficult than to live in them according to God*, and without acquiring an interest in them and a liking for them

907 The casuists submit the decision to the corrupt reason, and the choice of decisions to the corrupt will, in order that all that is corrupt in the nature of man may contribute to his conduct

908 But is it *probable* that *probability* gives assurance?
Difference between rest and security of conscience Nothing gives certainty but truth, nothing gives rest but the sincere search for truth

909 The whole society itself of their casuists cannot give assurance to a conscience in error, and that is why it is important to choose good guides
Thus they will be doubly culpable, both in having followed ways which they should not have followed, and in having listened to teachers to whom they should not have listened

910 Can it be anything but compliance with the world which makes you find things probable? Will you make us believe that it is truth and that, if duelling were not the fashion, you would find it probable that they might fight, considering the matter in itself?

911 Must we kill to prevent there being any wicked? This is to make both parties wicked instead of one *Vince in bono malum* [1] (Saint Augustine)

912 *Universal* —Ethics and language are special but universal sciences

913 *Probability* —Each one can employ it, no one can take it away

914 They allow lust to act, and check scruples, whereas they should do the contrary

915 *Mortality* —Lax opinions please men so much, that it is strange that theirs displease It is because they have exceeded all bounds Again, there are many people who see the truth, and who cannot attain to it but there are few who do not know that the purity of religion is opposed to our corruptions It is absurd to say that an eternal recompense is offered to the morality of Escobar

916 *Probability* —They have some true principles but they misuse them Now,

[1] Rom 12 21 'But overcome evil with good'

the abuse of truth ought to be as much punished as the introduction of falsehood

As if there were two hells one for sins against love the other for those against justice!

917 *Probability*—The earnestness of the saints in seeking the truth was useless if the probable is trustworthy The fear of the saints who have always followed the surest way (Saint Theresa having always followed her confessor)

918 Take away *probability* and you can no longer please the world give *probability* and you can no longer displease it

919 These are the effects of the sins of the peoples and of the Jesuits The great have wished to be flattered The Jesuits have wished to be loved by the great They have all been worthy to be abandoned to the spirit of lying the one party to deceive the others to be deceived They have been avaricious ambitious voluptuous *Coacervabunt tibi magistros*[1] Worthy disciples of such masters they have sought flatterers and have found them

920 If they do not renounce their doctrine of probability their good maxims are as little holy as the bad for they are founded on human authority and thus if they are more just they will be more reasonable but not more holy They take after the wild stem on which they are grafted

If what I say does not serve to enlighten you it will be of use to the people

If these are silent the stones will speak

Silence is the greatest persecution the saints were never silent It is true that a call is necessary but it is not from the decrees of the Council that we must learn whether we are called it is from the necessity of speaking Now after Rome has spoken and we think that she has condemned the truth and that they have written it and after the books which have said the contrary are censured we must cry out so much the louder the more unjustly we are censured and the more violently they would stifle speech until there come a Pope who hears both parties and who consults antiquity to do justice So the good Popes will find the Church still in outcry

The Inquisition and the Society are the two scourges of the truth

Why do you not accuse them of Arianism? For though they have said that Jesus Christ is God perhaps they mean by it not the natural interpretation but as it is said *Dii estis*[2]

If my *Letters* are condemned at Rome that which I condemn in them is condemned in heaven *Ad tuum Domine Jesu tribunal appello*[3]

You yourselves are corruptible

I feared that I had written ill seeing myself condemned but the example of so many pious writings makes me believe the contrary It is no longer allowable to write well so corrupt or ignorant is the Inquisition!

It is better to obey God than men

I fear nothing I hope for nothing It is not so with the bishops Port Royal

[1] II Tim 4 3 Shall they heap to themselves teachers
[2] Ps 81 6 Ye are gods
[3] To your tribunal Lord Jesus I call

fears, and it is bad policy to disperse them, for they will fear no longer and will cause greater fear I do not even fear your like censures, if they are not founded on those of tradition Do you censure all? What! Even my respect? No Say then what, or you will do nothing, if you do not point out the evil, and why it is evil And this is what they will have great difficulty in doing

Probability—They have given a ridiculous explanation of certitude, for, after having established that all their ways are sure, they have no longer called that sure which leads to heaven without danger of not arriving there by it, but that which leads there without danger of going out of that road

921 The saints indulge in subtleties in order to think themselves criminals and impeach their better actions And these indulge in subtleties in order to excuse the most wicked

The heathen sages erected a structure equally fine outside, but upon a bad foundation, and the devil deceived men by this apparent resemblance based upon the most different foundation

Man never had so good a cause as I, and others have never furnished so good a capture as you

The more they point out weakness in my person, the more they authorise my cause

You say that I am a heretic Is that lawful? And if you do not fear that men do justice, do you not fear that God does justice?

You will feel the force of the truth, and you will yield to it

There is something supernatural in such a blindness *Digna necessitas*[1] *Mentiris impudentissime*[2]

Doctrina sua noscetur vir[3]

False piety, a double sin

I am alone against thirty thousand No Protect you, the court, protect, you, deception, let me protect the truth It is all my strength If I lose it, I am undone I shall not lack accusations, and persecutions But I possess the truth, and we shall see who will take it away

I do not need to defend religion, but you do not need to defend error and injustice Let God, out of His compassion, having no regard to the evil which is in me, and having regard to the good which is in you, grant us all grace that truth may not be overcome in my hands, and that falsehood

922 *Probable*—Let us see if we seek God sincerely by comparison of the things which we love It is *probable* that this food will not poison me It is *probable* that I shall not lose my action by not prosecuting it

923 It is not absolution only which remits sins by the sacrament of penance, but contrition, which is not real if it does not seek the sacrament

924 People who do not keep their word without faith, without honour without truth, deceitful in heart, deceitful in speech for which that amphibious ani

[1] Wisd of Sol xix 4 Doom which they deserved
[2] Most impudent liars See *Provincial Letters* xv
[3] Prov xii 8 A man shall be commended according to his wisdom

mal in fable was once reproached which held itself in a doubtful position between the fish and the birds

It is important to kings and princes to be considered pious and therefore they must confess themselves to you

CONTENTS

SCIENTIFIC TREATISES



SCIENTIFIC TREATISES



PREFACE TO THE TREATISE ON THE VACUUM

WE have carried our respect for antiquity so far today, in matters in which it should have less influence, that we treat all its ideas as revelations and even its obscurities as mysteries, we can no longer advance new opinions without danger, and an author s text is enough to destroy the strongest arguments

Not that my intention is to correct one vice by another, and to have no esteem for the ancients because they are too much esteemed I do not want to banish their authority to set up reason alone, although there is an attempt to establish their authority alone to the prejudice of reason

To make this important distinction with care we must consider that one group depend exclusively on memory and are purely historical, having as their only object to know what the authors have written, the other group depend exclusively on reason and are wholly dogmatic having as their object to seek and discover *hidden truths Those of the first kind have the same limits as the books containing* them

It is in accordance with this distinction that we should regulate differently the extent of our respect The respect that we should have for

In matters in which we seek to know only what authors have written as in history, geography, jurisprudence, languages and above all in theology and in short wherever either the simple fact or an institution human or divine is the starting point, we must necessarily have recourse to books since all that can be known about such matters is contained there Whence it is evident that we can have the whole of that knowledge and that it is not possible to add anything to it

If it is a question of knowing who was the first king of France where the geographers put the first meridian what words are used in a dead language and everything of this sort, how could we find it out except from books? And who can add anything new to what they tell us about it since we desire to know only what they contain? Authority alone can give us light on such matters But it is in *theology that authority has its chief weight* because there it is inseparable from truth which we know only through it so that to give absolute certainty to things which reason can least grasp it is sufficient to point them out in Holy Scripture (as, to show the uncertainty of the most probable things we need only point out that they are not included there) because the principles of theology are above nature and reason and the mind of man too feeble to reach them by its own efforts can arrive at this highest knowledge only if carried there by an all powerful *and supernatural force*

It is quite otherwise with subjects accessible to sense or reasoning here authority is useless only reason can know them Authority and reason have their separate rights a moment ago one had all the advantage here the other is queen in her turn But since subjects of this kind are suited to the mind s reach it has perfect freedom to concern itself with them its inexhaustible fertility produces continually and its discoveries can be at once without end and without interruption

Thus it is that geometry arithmetic music physics medicine architecture and all the sciences subject to experiment and reason must be added to if they are to become perfect The ancients found them merely sketched by their predecessors and we shall leave them to our successors in a more perfected state than we received them Since their perfection depends upon time and effort it is evident that even if our effort and time had gained us less than the labors of the ancients separated from ours the two together nevertheless must have more effect than either alone

The clearing up of this difference should make us pity the blindness of those who advance authority alone as proof in physics instead of reason or experiment and should fill us with horror at the wickedness of others who use reason alone in theology instead of the authority of Scripture and the Fathers We must strengthen the courage of those timid souls who dare discover nothing in physics and confound the insolence of that temerity which introduces novelty into theology Meanwhile the misfortune of the age is such that we see many new opinions in theology altogether unknown to antiquity maintained with obstinacy and received with applause whereas those put forward in physics though few in number must be convicted of error it seems as soon as they shock however little received opinions As if respect for the philosophers of antiquity were a duty but for the most ancient of the Fathers only decorum! I leave it to the judicious to observe the importance of this abuse which perverts the order of the sciences so unjustly and I think there will be few who do not wish this to be applied to other subjects since new discoveries are inevitably errors in those matters we profane with impunity whereas they are absolutely necessary for the perfection of so many other subjects incomparably lower which however we would be afraid to touch

Let us make a more just distribution of our credulity and our doubt and set limits to our respect for the ancients Since reason is its source reason should also be its measure Let us consider that if the ancients had kept to this deference of daring to add nothing to the knowledge transmitted to them and if their contemporaries had been as much opposed to accepting anything new they would have deprived both themselves and their posterity of the fruit of their discoveries Just as they used the discoveries handed down to them only as the means of making new ones and that happy daring had opened the road for them to great achievements so we should take the discoveries won for us by them in the same spirit and following their example make these discoveries the means and not the end of our study and thus by imitating the ancients try to surpass them For what is more unfair than to treat our predecessors with more respect than they treated those who preceded them and to have for them that inviolable respect they have deserved from us only because they did not themselves have it for those who had the same advantage over them?

The secrets of nature are hidden Although she is always at work, her effects are not always discovered time reveals them from generation to generation, and although always the same in herself, she is not always equally known The experiments which give us our knowledge of nature multiply continually, and since they are the only principles of physics, the consequences multiply in proportion It is in this way that we can today have other ideas and new opinions without scorn and without ingratitude since the first knowledge given us by the ancients has served as steps to our own, and since we are indebted to them for the advantage of a position higher than theirs, because placed by them part way up the ladder, we are carried higher by our slightest effort and with less labor and less glory we find ourselves above them It is from that height we can discover things it was impossible for them to see Our view has a wider range and although they knew as well as we do everything they could observe of nature, they nevertheless did not know so much and we see more than they did

However it is a strange thing how we reverence their opinions To contradict them counts as a crime and to add to them is an outrage, as if they had left no more truths to know Is not this to treat man s reason with indignity and to put it on a level with animal instinct since we thereby take away the main difference, which consists in this that the effects of reason increase continually whereas instinct always remains in the same state? Beehives were as well laid out a thousand years ago as today, and each bee forms that hexagon as exactly the first time as the last It is the same with everything animals make by that hidden motion Nature teaches them in response to the pressure of necessity, but this frail knowledge dies with its need as they receive it without study, they do not have the happiness of preserving it, and every time they are given it, they find it new because nature, whose object is merely to maintain animals in an order of limited perfection, infuses in them this necessary knowledge, always the same lest they perish, and does not allow them to add to it lest they go beyond the boundaries prescribed to them It is different with man, made only for infinity He is ignorant in his life s first age, but he never ceases to learn as he goes forward for he has the advantage not only of his own experience but also of his predecessors because he always keeps in his memory the knowledge he has once acquired and that of the ancients is always at hand in the books they have left And since he keeps his knowledge, he can also easily increase it so that men today are in a certain sense in the same condition in which those ancient philosophers would be if they could have prolonged their old age until now, adding to the knowledge they had what their studies might have won for them by the grace of so many centuries Hence it is that by a special prerogative not only does each man advance from day to day in the sciences but all men together make a continual progress as the universe grows old, because the same thing happens in the succession of men as in the different ages of an individual man So that the whole series of men during the course of so many centuries should be considered as one self same man always in existence and continually learning Whence it is seen with what injustice we respect antiquity in the persons of its philosophers for since old age is the age furthest removed from childhood who does not see that the old age
versal man should be sought not in the times near his birth but in
e most distant from it? Those whom we call ancients were in tr
respect and actually formed the childhood of man, and since

their knowledge the experience of the succeeding centuries it is in ourselves that that antiquity can be found which we revere in others

The ancients should be admired for the consequences they drew correctly from the little stock of principles they had and they should be excused for those in which they lacked the advantage of experiment rather than force of reason

For were they not excusable for their opinion about the Milky Way when the weakness of their eyes as yet unaided by artifice they attributed its color to a greater density in that part of the sky which would more powerfully reflect the light? But would we not be inexcusable for holding to the same opinion now that with the help of the telescope we have discovered an infinity of little stars there whose more abundant light has made us recognize the true cause of that whiteness?

Did they not also have cause to say that all corruptible bodies were contained within the sphere of the moon s heaven when during the course of so many centuries they had never yet observed corruption or generation beyond this space? But should we not give contrary assurance when the whole earth has seen with its eyes comets burst into flame and vanish far beyond that sphere?

Thus it is that concerning the vacuum the ancients were right to say that nature did not permit it because all their experiments had always led to the observation that she abhorred it and could not endure it But if the new experiments had been known to them perhaps they would have found reason to affirm what they had reason to deny because the vacuum had not yet appeared Therefore in making the judgment that nature did not permit a vacuum they meant to speak of nature only as they knew her since to make the judgment in general it would not be enough to have seen it true in a hundred instances or in a thousand or in any other number however great for if there remained a single case to examine it alone would suffice to prevent the general definition and if a single case were opposed it alone For in all matters whose proof is by experiment and not by demonstration no universal assertion can be made except by the general enumeration of all the parts and all the different cases Thus when we say the diamond is the hardest of all bodies we mean of all bodies we know and we neither can nor should include those we do not know And when we say that gold is the heaviest of all bodies it would be rash of us to include in this general proposition bodies not yet in our knowledge although it is not impossible they are in nature Similarly when the ancients asserted that nature did not permit a vacuum they meant she did not permit a vacuum in all the experiments they had seen and they could not without rashness include experiments they did not know But if they had known them undoubtedly they would have drawn the same consequences as we do and would by their avowal have given them the authority of that antiquity which men today want to make the sole principle of the sciences

Thus without contradicting the ancients we can assert the opposite of what they said and finally whatever the weight of antiquity truth should always have the advantage even when newly discovered since it is always older than every opinion men have held about it and only ignorance of its nature could imagine it began to be at the time it began to be known

NEW EXPERIMENTS CONCERNING THE VACUUM

DONE IN TUBES, SYRINGES, BELLOWS, AND SIPHONS OF VARIOUS LENGTHS SIZES, AND SHAPES, WITH DIVERS FLUIDS, SUCH AS QUICKSILVER, WATER, WINE OIL, AIR, ETC

WITH A DISCOURSE ON THE SAME SUBJECT, IN WHICH IT IS SHOWN THAT A VESSEL AS LARGE AS CAN BE PROCURED MAY BE EMPTIED OF ALL SUBSTANCES KNOWN IN NATURE WHICH ARE CAPABLE OF BEING PERCEIVED BY THE SENSES, AND WHAT FORCE IS NECESSARY FOR THE CREATION OF THIS VACUUM

DEDICATED TO M PASCAL, PRIVY COUNCILOR AND COUNCILOR OF STATE TO THE KING, BY B P, HIS SON, THE WHOLE HAVING BEEN REDUCED TO A SUMMARY AND PUBLISHED IN ADVANCE OF A LARGER TREATISE ON THE SAME SUBJECT

TO THE READER

My dear reader, since certain considerations prevent my publishing at this time in its entirety a treatise in which I have reported many new experiments I have made concerning the vacuum together with the conclusions I have drawn from them, I decided to give an account of the chief of them in this summary, where you will see in advance the plan of the whole work

The occasion of these experiments was as follows *About four years ago in Italy it was found that a glass tube four feet in height, with one end open and the other hermetically sealed, having been filled with quicksilver and the open end then stopped by a finger or in some other way and the tube placed vertically with the stopped end down and plunged two or three fingers breadths into some more quicksilver contained in a vessel half full of quicksilver and half full of water, if the stopper is removed the tube remaining plunged in the quicksilver of the vessel, the quicksilver of the tube descends part way leaving at the top of the tube an apparently empty space the bottom of the tube remaining full of quicksilver up to a certain height And if the tube is lifted a little until its open end which had been dipped in the quicksilver of the vessel leaving this quicksilver, reaches the region of water, the quicksilver of the tube rises to the top with the water and the two liquids are mingled in the tube, but finally all the quicksilver falls and the tube is found to be entirely filled with water*

An account of this experiment having been sent from Rome to the Rev Father Mersenne, Minim, at Paris he made it public in France in the year 1644 to the admiration of all the learned and curious through whose intercourse it became famous on all sides I heard about it from M Petit Superintendent of Fortifications and skilled in all good learning who had heard about it from the Rev Father Mersenne himself We did the experiment together at Rouen the said M Petit and I in the same way it had been done in Italy and we found every detail just as it had been reported from that country without noticing at that time anything new

Afterwards reflecting on the consequences of these experiments, I was confirmed in the opinion I had always held that the vacuum was not a thing impossible in nature and that she did not shun it with so much horror as many imagine

I was forced to this opinion by seeing how slight was the foundation of the maxim so widely accepted that nature does not permit a vacuum a maxim based only on experiments of which the greater number are false though considered most certain and of the rest some are so far from contributing to its proof that they show nature abhors too much fulness rather than flees a vacuum and the most favorable do not bring anything more to light than that nature abhors a vacuum they do not show that she cannot suffer it to be

To the weakness of this principle I added our daily observations of the rarefaction and condensation of the air which as some have found can be condensed to the thousandth part of the place it seemed to occupy before and which can become so rare that I thought there must be either a large vacuum between its parts or penetration of dimensions But since everyone did not accept that as proof I believed this Italian experiment might convince even those who were the most obsessed with the impossibility of the vacuum

However prejudice was strong enough again to invent objections which robbed the experiment of the belief it deserved Some said that the top of the tube was filled with spirits of mercury others with a rarefied and imperceptible particle of air others with a kind of matter which only existed in their imagination and all in a conspiracy to banish the vacuum vied with each other in the exercise of that power of the mind called subtlety in the schools which for the solution of real difficulties gives only empty words without foundation I resolved therefore to devise such convincing experiments that they should be proof against all possible objections and at the beginning of this year I performed a great many of which some are related to the Italian experiment and others are entirely different having nothing in common with it These experiments were so accurate and so successful that I showed by means of them that the largest vessel procurable can be emptied of every substance perceived by sense and known in nature and what force is necessary for the creation of this vacuum In this way I also tested the height a siphon must have if it is to do what is expected of it beyond which height it ceases to act contrary to the opinion universally accepted by the world for so many centuries as also the slight force required to draw up the piston of a syringe without any matter taking its place and many other things that you will find in the complete work, in which it is my intention to show what force nature exerts to avoid a vacuum and that she actually admits it and suffers its existence in a large space which can easily be emptied of every substance perceptible to sense Accordingly I have divided the complete treatise into two parts of which the first contains a detailed account of all my experiments with accompanying figures and a summary of the results divided into a number of maxims And the second part contains the consequences I have drawn from the experiments divided into several propositions in which I have shown that the apparently empty space which appeared in the experiments is actually empty of every substance perceptible to sense and known in nature And in the conclusion I give my opinion on the subject of the vacuum and reply to the objections that can be made Thus I am content to show a large empty space and I leave it to the learned and curious to find out what goes on in such a space (as whether animals live there whether the refraction of glass is diminished by it and whatever can be done there) making no mention of it in this treatise a summary of which I have thought it appropriate to give you in advance because having made these

experiments with much expense, effort, and time, I was afraid that someone else who had spent neither time, money, nor effort might anticipate me and make public things he had not seen and which consequently he could not report with the exactness and order necessary for their proper deduction, for there is no one who has had tubes and siphons so long as mine, and there are few who would be willing to take the necessary trouble to get them.

And since honest men add to the common desire of all men to maintain themselves in their rightful possessions the desire to refuse the honor which is not their due, you will undoubtedly approve of my defending myself equally against those who would take from me some of the experiments which I report to you here and which I promise you in the complete treatise, since they are of my own invention, and against those who would attribute to me the Italian experiment I have spoken to you about, since it is not mine. For although I have performed it in more ways than anyone else and with tubes twelve and even fifteen feet long, nevertheless I shall not even speak of it in these writings because I am not its discoverer and because it is my intention to give only those experiments which are of my own invention and altogether mine.

Summary of the first part, in which the experiments are reported

EXPERIMENTS

1. A glass syringe with a carefully fitted piston having been completely immersed in water and its opening closed by a finger touching the bottom of the piston (thus obliging the hand and arm to be in the water), only a moderate force is required to draw the piston up and make it separate from the finger without any water coming in (which the philosophers believed could not be done with any finite force), and thereby the finger is felt to be strongly and painfully pulled, and the piston leaves an apparently empty space, into which it does not appear any body can have entered, since it is entirely surrounded by water which could have had no access to it because the opening had been closed; and if the piston is drawn higher, the apparently empty space becomes greater but the finger is not felt to be more pulled. And if the syringe is lifted almost entirely out of the water so that only its opening and the covering finger remain in it, then upon the finger's being removed the water, contrary to its nature, rises with violence and entirely fills all the space left by the piston.

2. A bellows carefully closed on every side produces the same effect, with a similar preparation, contrary to the opinion of the same philosophers.

3. A glass tube forty-six feet long, open at one end and hermetically sealed at the other, having been filled with water or rather with very red wine for greater visibility, then stoppered and lifted in this condition and placed vertically, the stoppered end down, in a vessel full of water with about one foot of the tube below the surface of the water, if the stopper is removed, the wine in the tube descends to a certain height, which is about thirty-two feet above the surface of the water in the vessel, and runs out and mingles with the water in the vessel, to which it gives a tinge of color, and separating from the top of the glass leaves a space of about thirteen feet apparently empty, where again it does not appear any body can have taken its place. And if the tube is inclined, as then the height of the wine in the tube is decreased by this inclination, the wine ascends until

reaches the height of thirty two feet And finally if the tube is inclined to the height of thirty two feet it is entirely refilled thus drawing back as much water as it had rejected wine so that it is seen to be full of wine from the top to about thirteen feet from the bottom and filled with slightly colored water in the thirteen feet remaining

4 A scalene siphon of which the longer leg is fifty feet long and the shorter leg is forty five having been filled with water and the two stoppered openings immersed about a foot in two vessels filled with water so that the siphon is vertical and the surface of the water of one vessel is five feet higher than the surface of the other if the stoppers of the openings are removed with the siphon in the position described the longer leg does not attract the water in the shorter leg nor consequently that in the vessel in which the shorter leg dips contrary to the opinion of all philosophers and artisans but the water descends from both legs into the two vessels until it reaches the same height as in the afore mentioned tube measuring the height from the surface of the water of each vessel But when the siphon is inclined at a height less than about thirty one feet the longer leg attracts the water in the vessel of the shorter leg and when the siphon is drawn up again toward the vertical the attraction stops and water flows from both sides into their respective vessels And when the siphon is lowered again the water in the longer leg attracts the water in the shorter as before

5 If a cord about fifteen feet long with a thread fastened to the end (having been left in water for a long time in order that whatever air may have been enclosed in the cord might be expelled by the gradual absorption of moisture) is put in a tube fifteen feet long sealed at one end as above and filled with water so that outside the tube there is only the thread attached to the cord to pull it with and the opening of the tube is placed in quicksilver when the cord is pulled little by little the quicksilver rises in proportion until the height of the quicksilver added to the fourteenth part of the height of the water remaining is two feet three inches For afterwards when the cord is pulled the water quits the top of the glass and leaves an apparently empty space which increases in proportion as the cord is pulled But if the tube is inclined the quicksilver of the vessel rises in it so that if it is inclined enough it is completely filled with quicksilver and water which strikes the top of the tube with violence making the same noise and the same sharp sound as if it were breaking the glass which does in fact run the risk of being broken And lest it be suspected that some air may have remained in the cord the same experiment may be performed with a number of little wooden cylinders fastened together with brass wire

6 A syringe with an accurately fitted piston having been placed in quicksilver so that its opening is immersed at least an inch and the rest of the syringe stands vertically outside if the piston is drawn up the syringe remaining as described the quicksilver entering by the opening of the syringe rises and remains in contact with the piston until it has been drawn up in the syringe two feet three inches But after this height if the piston is drawn up more it does not attract the quicksilver higher which continuing to remain at this height of two feet three inches quits the piston so that an apparently empty space is formed which increases in proportion as the piston is drawn up more *It is probable that the same thing happens in a suction pump and that the water rises only to a height of thirty one feet which corresponds to that of two feet three inches of quicksilver* And what is more remarkable is

that the syringe, weighed as it is without being taken from the quicksilver or moved in any way, weighs just as much (although the apparently empty space be as small as we please) as when, the *piston having been drawn up more* the apparently empty space is made as great as we please, and that it always weighs the same as the body of the syringe with the two feet, three inches of quicksilver it *contains when there is not yet any apparently empty space, that is, when the piston* has not yet quit the quicksilver in the syringe but is ready to separate from it at the slightest pull So that the apparently empty space, although all the bodies surrounding it tend to fill it, does not change its weight, and however these spaces may differ in size, they differ not at all in weight

7 A siphon with one leg ten feet long and the other nine and a half, having been filled with quicksilver and the two openings having been immersed about an inch each in two vessels of quicksilver so that the surface of the quicksilver in one vessel is half a foot higher than in the other, when the siphon is vertical the *longer leg does not attract the quicksilver of the shorter* but the quicksilver breaking at the top, descends in each of the legs and pours into the vessels falling to the ordinary height of two feet three inches from the surface of the quicksilver in each vessel But if the siphon is inclined, the quicksilver in the vessels rises again in the legs fills them and begins to run from the shorter leg into the longer leg and thus empties the shorter leg s vessel, for the inclining of tubes containing an apparent vacuum, when they are in a fluid always attracts the fluids in the vessels if the openings of the tubes are not closed, or attracts the finger if it closes these openings

8 The same siphon having been entirely filled with water and afterwards with a cord as above and the two openings having also been put in the same two vessels of quicksilver, when the cord is drawn through one of the openings the quicksilver rises from the vessels into both of the *legs* so that the fourteenth part of the height of the water in one leg together with the height of the quicksilver which has risen, is equal to the fourteenth part *of the height of the water* in the other, added to the height of the quicksilver which has risen which will be the case as long as the fourteenth part of the height of the water, added to the height of the quicksilver in each leg is two feet, three inches high for afterwards the water will divide at the top and there will be an apparent vacuum

From these experiments and from several others reported in the complete book, in which are seen tubes of all lengths sizes and shapes, filled with different fluids immersed in divers ways in different fluids carried from one to another, weighed in several ways and in which are observed the different attractions felt by the finger stopping the mouths of tubes containing an apparent vacuum it is clear that we may deduce the following maxims

Maxims

1 That it is repugnant to all bodies to separate from each other and to admit an apparent vacuum between them that is nature abhors an apparent vacuum

2 That this abhorrence or repugnance on the part of all bodies is no greater for a large apparent vacuum than for a small one that is for a wide interval of separation than for a narrow one

3 That the force of this abhorrence is limited and equal to that with which water of a certain height which is about thirty-one feet tends to flow downward

4 That the bodies forming the boundaries of an apparent vacuum tend to fill i

5 That this tendency is not greater for a large apparent vacuum than for a small one

6 That the force of this tendency is limited and always equal to that with which water at a certain height which is about thirty one feet tends to flow downward

7 That a force greater by however little than that with which water at a height of about thirty one feet tends to flow downward is sufficient to cause an apparent vacuum and as great as we please that is to separate bodies by as great an interval as we please provided there is no other obstacle to their separation and going apart than nature s horror of an apparent vacuum

Summary of the second part in which are reported the consequences of these experiments concerning the matter that might fill this apparently empty space divided into several propositions with their demonstrations

PROPOSITIONS

1 That the apparently empty space is not filled with the outside air surrounding the tube and that air has not come in through the pores of the glass

2 That it is not filled with the air which some philosophers say is enclosed in the pores of all bodies air which would be in this way in the liquid filling the tubes

3 That it is not filled with the air which some consider to be between the tube and the liquid which fills it and enclosed in the interstices or atoms of the small bodies constituting these liquids

4 That it is not filled with an imperceptible particle of air remaining by chance between the liquid and the glass either carried by the finger acting as a stopper or introduced in some other way which would become extraordinarily rarefied and which some rather than admit a vacuum would maintain could become sufficiently rarefied to fill the whole world

5 That it is not filled with a bit of quicksilver or water which drawn in one direction by the walls of the glass and in the other by the force of the liquid becomes rarefied and transformed into vapor so that this reciprocal attraction has the same effect as heat which transforms these liquids into vapor and makes them volatile

6 That it is not filled with the spirits of the liquid contained in the tube

7 That it is not filled with a finer air mixed with the outside air which separated from it and having entered through the pores of the glass would always tend to return or would be continually attracted back

8 That the apparently empty space is not filled by any substance known in nature and perceptible to any sense

SUMMARY OF THE CONCLUSION IN WHICH I GIVE MY OPINION

After having demonstrated that none of the substances perceived by our senses and known by us fills this apparently empty space I shall think until I am shown the existence of a substance filling it that it is really empty and void of all matter

Therefore I shall say of the real vacuum what I have shown of the apparent vacuum and I shall consider the above maxims as true when now enunciated of the absolute vacuum as before of the apparent

MAXIMS

1 That it is repugnant to all bodies to separate from each other and to admit a vacuum between them, that is, *nature abhors a vacuum*

2 That this abhorrence or repugnance on the part of all bodies is not greater for a large vacuum than for a small one, that is, for a wide interval of separation than for a narrow one

3 That the force of this abhorrence is limited and equal to that with which water at a certain height, which is about thirty one feet, tends to flow downward

4 That the bodies forming the boundaries of a vacuum tend to fill it

5 That this tendency is not greater for a large vacuum than for a small one

6 That the force of this tendency is limited and always equal to that with which water at a certain height, which is about thirty one feet, tends to flow downward

7 That a force greater by however little than that with which water at a height of about thirty one feet tends to flow downward is sufficient to cause a vacuum, and as great as we please, that is, to separate bodies by as great an interval as we please, provided there is no other obstacle to their separation and going apart than nature s horror of a vacuum

AFTERWARDS I REPLY TO THE OBJECTIONS THAT COULD BE MADE, OF WHICH THE CHIEF ARE

OBJECTIONS

1 That this proposition, a space is empty, is repugnant to common sense

2 That this proposition nature abhors a vacuum and nevertheless permits it to exist, accuses her of impotence or implies contradiction

3 That many experiments, and even our everyday experience show that nature cannot suffer the existence of a vacuum

4 That an *imperceptible matter*, unheard of and unknown to any sense, fills this space

5 That since light is either an accident or a substance, it is not possible for it to exist in a vacuum *if it is an accident* and that it fills the apparently empty space if it is a substance

PASCAL S ANSWER

To the Very Good Reverend Father Noël Rector of the Society of Jesus Paris

MY VERY REVEREND FATHER

The honor you have done me in writing to me obliges me to give up my intention of resolving none of the difficulties mentioned in my *abridgement* except in the complete work on which I am at present engaged For since the civilities of your letter are joined to the objections you raise against me I cannot divide my answer nor acknowledge the former without satisfying the latter

But to proceed with more order permit me to remind you of a universal rule which is applicable to all the particular subjects in which it is a question of establishing truth I do not doubt you will accept it since it is generally admitted by all who consider things without prejudice and since it constitutes the chief part of the method of the schools in dealing with the sciences and that used by seekers after what is really solid filling and fully satisfying the mind The rule

is never to make a decisive judgment affirming or denying a proposition unless what one affirms or denies satisfies one of the two following conditions either that of itself it appear so clearly and distinctly to sense or to reason according as it is subject to one or the other that the mind cannot doubt its certainty and this is what we call a *principle* or *axiom* as for example *if equals are added to equals the results are equal* or that it be deduced as an infallible and necessary consequence from such principles or axioms upon whose certainty entirely depends that of the consequences correctly drawn from them as this proposition *the three angles of a triangle are equal to two right angles* which not being self evident is evidently demonstrated as an infallible consequence of such axioms Everything satisfying one of these two conditions is certain and true and everything satisfying neither is considered doubtful and uncertain We pass decisive judgment on things of the first kind and leave the rest undecided calling them according to their deserts now a *vision* now a *caprice* occasionally a *fancy* sometimes an *idea* and at the most a *happy thought* and since it is rash to affirm them we incline rather to the negative ready however to return to the affirmative if a convincing demonstration brings their truth to light And we reserve for the mysteries of the faith revealed by the Holy Spirit Himself that submission of mind which leads us to believe in mysteries hidden from sense and reason

This principle having been laid down I turn to your letter in whose first lines to prove that the space in question is a body you make use of the following words *I say that it is a body since it acts like a body transmitting light with refraction and reflection and retarding the motion of another body* Upon which I observe that you base your claim that it is a body upon two principles the first is that it trans mits light with refraction and reflection the second that it retards the motion of a body Of these two principles the first has seemed true to none of those who have tried to get experimental evidence of it and we have always found on the contrary that the ray penetrating the glass and the apparently empty space has no refraction other than that caused by the glass and that therefore if some matter fills this space either it in nowise bends the ray or the refraction is not perceptible so that since you have undoubtedly experienced nothing to the contrary I per ceive that the meaning of your words is that the ray reflected or refracted by the glass passes through this space From that and from the fact that bodies take time to fall there you wish to conclude that it is filled by a material substance which transmits the light and causes the retardation of motion

But Reverend Father if we refer this to the method of reasoning we have spoken of we shall find that we should first have to agree upon the definition of empty space of light and of motion and to show from the nature of these things a manifest contradiction in the propositions Light penetrates empty space and it takes time for a body to move there Until then your proof cannot hold and since moreover the nature of light is unknown both to you and to me since of all those who have tried to define it not one has satisfied any seeker after experi enceable truths and since it will perhaps remain eternally unknown to us I fore see that it will be a long time before this argument acquires enough strength to be convincing

For I beg you to consider how it is possible to conclude infallibly that the nature of light is such that it cannot exist in the void when we do not know what the nature of light is But if our knowledge of it were as complete as is our ig

norance, we should know perhaps that it would exist in the void with more brilliance than in any other *medium* since we perceive that it increases its strength according as the *medium* in which it is becomes rarer and so somehow closer to nothingness And if we knew the nature of motion, I do not at all doubt that it would appear to us that motion ought to take almost as much time in a vacuum as in air, whose non resistance is apparent in the equal falling time of bodies of different weights

This is why, with our slight knowledge of the nature of these things, if by a similar liberty I conceive a thought which I offer as a principle, I can say with as much show of reason light subsists in a vacuum and it takes time for a body to move there, but light penetrates this apparently empty space and it takes time for a body to move there, hence it may be really empty

Therefore let us put off this proof until such time as we shall know the nature of light Until then I cannot admit your principle and it will be hard for you to prove it And let us not, I beg you, draw infallible consequences from the nature of a thing when we do not know it, otherwise I should be afraid that you were not in agreement with me on the conditions necessary for a perfect demonstration, and that you would call certain what we only call doubtful

In the rest of your letter, as if you had invincibly established that this void space is a body, you concern yourself only with finding what body it is, and to decide positively what kind of matter fills it you begin as follows Let us assume that, just as blood is made up of several liquids mingled together so air is made up of air and fire and the (remaining) four elements which enter into the composition of all natural bodies You then *assume* that this fire can be separated from the air, and that once separated it can penetrate the pores of the glass you again *assume* that once separated it has an inclination to return and again that it is incessantly drawn back, and you explain these statements, intelligible enough in themselves, by bringing in certain analogies

But I think you offer this as an idea, Father, and not as a demonstration and however hard it is for me to reconcile this belief with the end of your letter, I believe that if you wanted to give proofs, they would not be so unfounded For in these times when so many learned men are trying with such care to find what matter fills this space, when this problem is agitating so many minds it would be hard for me to believe you would offer as the longed for solution of a question so justly doubtful nothing but a substance of which you suppose not only the properties but the very existence itself so that if anyone will make the contrary *assumption*, he will draw a contrary consequence just as necessarily If this kind of proof is acceptable, there will no longer be any difficulty in solving the greatest difficulties And the ocean tides and the magnet's attraction will become easy to understand if it is permissible to make substances and properties for the purpose

For all things of this kind whose existence is not manifest to sense are as hard to believe as they are easy to invent Many persons, even among the most learned men of the day, have opposed me with this same substance before you (but simply as an idea and not as a certain truth) and that is why I mentioned it among my propositions Others to fill empty space with some kind of matter have imagined one with which they have filled the entire universe because imagination has this peculiarity that it produces with as little trouble and time the great things and trouble as little things some have even [illegible] of the same [illegible]

stance as the sky and the elements and others of a different substance as their fancy dictated for they disposed of it as of their own work

But if we ask of them as of you that they show us this matter they answer that it cannot be seen if we ask that it make a sound they say it cannot be heard and so with all the remaining senses and they think they have done much when they have convicted others of powerlessness to show that it does not exist by depriving themselves of all power to show that it does

But we find more cause to deny its existence on account of our inability to prove it than to believe it for the sole reason that it cannot be shown not to be

For we cannot believe in all these substances at once without making nature a monster and since reason cannot incline more toward one than toward another because she finds them equally remote she rejects them all to avoid an unjust choice

I know you can say that you have not made this matter of yours all by yourself and that many physicists had already worked at it But in this matter we base nothing on authority when we cite authors we cite their demonstrations and not their names we respect them only in historical matters so that if the authors you cite said they saw those little fiery bodies mingled with the air I should sufficiently defer to their sincerity and to their accuracy to believe they were telling the truth and I should believe them as historians but since they only say they think these particles are constituents of the air you will permit me to remain in my first doubt

Finally Father consider I beg you that all the men there are put together could not demonstrate that any body succeeds that which leaves the apparent vacuum and again that it is impossible for all the men there are to show that when the water refills it some body has left Should not that be sufficient following your maxims to assure the emptiness of the space? However I simply say that my opinion is that it is empty Judge whether those who speak with so much restraint about something they have a right to speak about with so much assurance will find it possible to make a decisive judgment on the existence of this fiery matter so doubtful and so little established

After having supposed this substance with all the properties you wanted it to have you explain some of my experiments It is not a very difficult thing to explain how an effect can be produced if we suppose the substance the nature and the qualities of its cause however it is hard for those who imagine them to resist an idle satisfaction and a secret charm which they find in their invention especially when they have worked them out so well that from the imaginations they have supposed they necessarily infer truths already evident

But I feel obliged to say a word or two to you in this connection Every time to find the cause of several known phenomena we frame an hypothesis this hypothesis can be of three kinds

For sometimes an obvious absurdity follows from its negation and then the hypothesis is true and certain or an obvious absurdity follows from its affirmation and then the hypothesis is considered false and when we have not yet been able to draw an absurdity either from its negation or from its affirmation the hypothesis remains doubtful So that to establish the truth of an hypothesis it is not enough that all the phenomena should follow from it whereas if there follows from it something opposed to a single phenomenon that is enough to make certain its falsity

For example if someone finds a hot stone without knowing why it is hot, would he who should reason as follows be thought to have found the true cause Let us assume that this stone has been put in a big fire, from which it has very recently been removed, therefore this stone should still be hot, but it is hot, consequently it had been put in the fire? For that, fire would have to be the only cause of a stone s being hot, but since such heat can come from the sun or from friction, this inference would have no cogency For just as the same cause can produce several different effects, so the same effect can be produced by several different causes Thus in the discourse of natural reason on the motion or the stability of the earth all the phenomena of the motions and retrogradations of the planets follow perfectly from the hypotheses of Ptolemy, of Tycho of Copernicus and from many others that could be framed, of all of which only one can be true But who will venture to discern so far, and who can without risk of error support one to the prejudice of the others, as in the analogy of the stone who can with insistence maintain it is hot because of fire without making himself ridiculous?

You see from this that even if all the phenomena of my experiments followed from your hypothesis, it would still be like the rest and that always remaining in terms of probability, it would never reach those of demonstration But I hope one day to make you see more at length that the necessary consequences of its affirmation are opposed to the experiments And to touch upon one of them in a few words here If it is true as you suppose that the apparent vacuum is filled with that more subtle and fiery air, and that it has the inclination you suppose to return to the air it left, and that the outside air has the force to draw it back *like a squeezed sponge*, and that it is by this mutual attraction that the quicksilver is held suspended and is even made to rise again when the tube is inclined it necessarily follows that when the apparent vacuum is greater, a larger column of quicksilver should be suspended (contrary to what is seen in the experiments) For since all the parts of the inside and outside air have this power of attraction it is certain by all the laws of mechanics that their quantity increased directly as the space must necessarily increase their effect as a large sponge when squeezed absorbs more water than a small one

But if to resolve this difficulty you make a second supposition and if you make another quality on purpose to save this awkwardness which still not accurate enough, obliges you to imagine a third supposition to save the other two without any proof any support I shall never have anything to say except what I have already said, or rather I shall think I have already answered you

But when I say this Father, and when I anticipate in some sort these last suppositions I myself make a false supposition for I do not doubt that if you give us something it will be supported by convincing arguments since otherwise you would be imitating those who wish only to show that they have no lack of words

Finally, Father to restate the whole of my answer if it should be true that this apparently empty space where a body (which I am very far from granting you) and the air were filled with fiery spirits (which I do not even find probable) and that they had the qualities you assign them (which is only a mere idea evident neither to you nor to anyone) it would not follow that this space was filled with them And again if it should be true that by supposing it were filled with them (which is in no way apparent) we could deduce everything in the experiments,

the most favorable judgment we could make of this opinion would be that it is probable But since we necessarily infer from it things opposed to the experiments judge what place it should have among the three kinds of hypotheses we spoke of above

Toward the end of your letter to define body you only mention a few accidents and those relative as *top bottom right left* which actually constitute the definition of space and which apply to a body only in so far as it occupies space For according to your own authors body is defined as *what is composed of form and matter* and what we call a *void space* is a space having length breadth and depth motionless and capable of receiving and containing a body of the same size and shape this is what we call a *solid* in geometry where we consider only abstract and immaterial things So that the essential difference between empty space and body which has length breadth and depth is that one is immobile and the other is mobile and that one can receive within itself a body which penetrates its dimensions whereas the other cannot for the maxim on the impenetrability of dimensions is to be understood only of the dimensions of two material bodies otherwise it would not be universally accepted Whence it can be seen that there is as much difference between nothingness and empty space as there is between empty space and material body and that thus empty space is a mean between material body and nothingness That is why the maxim of Aristotle you mention *that non beings do not have differences* is to be understood of true nothingness and not of empty space

I take leave of your letter where you say that you do not recognize as *being held by any physicist* the fourth of my objections namely that a matter unheard of and not known to any sense fills this space To which I answer that I can assure you of the contrary since it is held by one of the most celebrated physicists of our time whom you could have found in his works filling the whole universe with a universal matter imperceptible and unheard of of the same substance as the sky and the elements and moreover that in examining your own matter I have found it to be so imperceptible and to have qualities so unheard of that is never considered as belonging to it that I find it to be of the same nature

The sentence preceding your final civilities defines light as follows *Light is a luminary motion of rays composed of lucid that is luminous bodies* with respect to which I must say that it seems to me you should first have defined *luminary* and *lucid* or *luminous body* for until that is done I cannot understand what light is And since we never use in definitions the term *defined* I should have difficulty in accepting yours which says that *light* (lumiere) is a *luminary* motion of *luminous* bodies There you have my views Father which I shall always submit to yours

For the rest you cannot be denied the glory of having maintained Peripatetic physics as well as it can be maintained and I find your letter not less a mark of the weakness of the opinion you defend than of the vigor of your mind

Certainly the skill with which you have defended the impossibility of a vacuum in the decline of its strength makes it easy to see that with an equal effort you would invincibly have established the opposed opinion in the advantages given it by the experiments

The same indisposition that has deprived me of the honor of seeing you has kept me from writing with my own hand It is for this reason I beg you to excuse the mistakes of my letter especially in spelling

I am with all my heart, Very Reverend Father, your very humble and very obedient servant,

PASCAL

Paris, *October* 29, 1647

LETTER FROM PASCAL TO M LE PAILLEUR, CONCERNING FATHER NOËL, JESUIT

SIR,

Since you wish to know why I broke off the correspondence which the Reverend Father Noël had done me the honor of engaging me in, I want to give you prompt satisfaction, and I do not doubt that if you blamed my conduct before knowing its cause, you will approve it when you know the reasons that have held me back.

The strongest is that the Reverend Father Talon when he took the trouble to bring me Father Noël s last letter, informed me in the presence of three of your good friends that Father Noël was distressed by my illness that he feared my first letter had affected my health, and that he begged me not to run the risk of a second, in a word, not to answer, that we could clear up by word of mouth any remaining difficulties and that *moreover he begged me not to show his letter to* anyone, that since he had written it only for me, he wished it to be seen by no one else, and that to make letters public was to violate their nature, addressed as they are to particular persons

I confess that if this proposal had come from anyone except these good fathers I should have been suspicious and I should have feared that its author wished to take advantage of my silence after having secured it by trickery But I had so little doubt of their sincerity that I promised everything without reservation or fear Afterwards I was especially careful to keep Father Noël s letter to myself and not to answer it Whereupon several persons and even some Jesuit fathers who were *not well informed of the wishes of Father Noël took occasion to say that having* found in his letter the overthrow of my opinions I concealed its beauties lest my shame be discovered, and that it was by my weakness alone I was prevented from replying

You see Sir how unfortunate for me this circumstance was since I could not conceal the letter without disadvantage nor make it public without breach of faith and that my honor was equally threatened both by a reply and by silence in that one betrayed my promise and the other my interest

However I religiously kept my word and I was saving my reply to his letter for the treatise in which I have to make specific answers to all the objections made *against the proposition advanced in my* abridgement that this space is not filled with any substance perceptible to sense and known in nature Accordingly I thought I was not at all obliged to be in a hurry with my reply, which I wished to make more exact by postponing it for a while To these considerations I added this that since all differences of this kind go on forever unless someone breaks them off and since they cannot be concluded unless one of the two parties leaves as to make an end I thought that the age, distinction and calling of Father Noël obliged me to yield him the advantage of having had the last word in the matter. But besides all these reasons I confess that his letter alone was enough to give me a dispensation from answering and I am sure you will think [illegible] it seems to [illegible].

been expressly conceived in terms that would not put upon me the obligation of a reply

To make this clear I shall put before you the points Father Noel takes up but in a different order such as he undoubtedly would have followed in a more elaborate work but did not judge necessary in the artlessness of a letter for each of these points is scattered throughout the whole body of his discourse and lodged in almost every part of it

It is his intention to state that he was led by my letter to give up his first opinion without being able however to fall in with mine So that we may consider his letter as having two parts of which one contains the things that prevent him from agreeing with me and the other those that support his second view With respect to each of these parts I hope to show you how little I was obliged to reply

As to the first concerning the things that keep him from my view his first difficulties are that the apparently empty space can only be a body since it receives and transmits light and since it retards the motion of another body But I thought I had sufficiently shown him in my letter the weakness of these same objections as contained in his first letter for I told him in tolerably clear words that even if it takes time for bodies to fall in this space and even if it is penetrated by light these effects should not necessarily be attributed to a substance filling it since it is possible that they belong to the nature of motion and of light and that as long as we remain in our present ignorance of the nature of these things we should make no inferences from it since they would be based merely on uncertainty and that just as Father Noel infers from the appearance of these effects that this space is filled by a substance receiving light and retarding motion it is possible with as much reason to infer from these effects that light subsists and motion requires time in a vacuum in view of the fact that so many other things were favorable to this latter view that it was in the opinion of the learned incomparably more probable than the other even before it received the support of these experiments

But if Father Noel has shown here that he paid little attention to that part of my letter he gives evidence of not having understood another part by the second thing shocking him in my view for he imputes to me an opinion contrary to the terms both of my letter and of my printed statement and entirely opposed to the foundation of all my maxims He imagines that I decisively asserted the real existence of the vacuum and on the basis of this imagination which he takes as certain truth he exercises his pen to show the weakness of the assertion

However he could have seen I wrote in my printed statement that my conclusion is simply that I shall think this space is empty until I have been shown that some substance fills it which is not an assertion of the reality of the vacuum and he could also have seen that I wrote in my letter the following words which seem to me sufficiently clear Finally Father consider I beg you that all the men there are put together could not demonstrate that any body succeeds that which leaves the apparent vacuum and again that it is impossible for all the men there are to show that when the water refills it some body has left Should not that be sufficient following your maxims to assure the emptiness of the space? However I simply say that my opinion is that it is empty Judge whether those who speak with so much restraint about something they have a right to speak about with so much assurance will find it possible to make a decisive judgment on the existence of this fiery matter so doubtful and so little established

Accordingly I should never have guessed what gave rise to this idea in Father Noël if he had not revealed it to me himself in the first page, where he faithfully repeats the definition of void space I gave in my letter, which is as follows "What we call a void space is a space having length, breadth, and depth motionless and capable of receiving and containing a body of the same size and shape, this is what we call a *solid* in geometry, where we consider only abstract and immaterial things " After having repeated this definition word for word he immediately derives from it this consequence "There, Sir, is your notion of void space, very clearly stated, I am willing to believe that all this is obvious to you and that your mind is convinced and fully satisfied by it, since you affirm it"

If he had not repeated my own words, I should have supposed he had misread them or that they had been badly written, and that instead of the first words *I call*, he must have found, *I assert* But since he quoted my entire sentence I can only suppose he believes one of these terms necessarily implies the other, and that he does not distinguish between defining a thing and asserting its existence

Therefore he believed that I asserted the real existence of the vacuum by the very terms with which I defined it I know that those who are not accustomed to seeing things handled in the true order imagine that we cannot define a thing unless we are assured of its existence, but they should notice that we ought always to define things before investigating their possibility and that the steps leading to the knowledge of truths are definition, axiom, and proof For first we conceive the idea of a thing, then we give a name to this idea, that is we define it and finally we try to discover the truth or falsity of the thing If we find it is impossible, it passes for error, if we demonstrate its truth, it passes for truth and as long as we can demonstrate neither its possibility nor its impossibility it passes for *imagination Whence it is evident that there is no necessary connection between* the definition of a thing and the assertion of its existence and that we can just as well define an impossible thing as a true thing Thus we can call rectilinear and rectangular a triangle we should imagine as having two right angles, and afterwards show that such a triangle is impossible, thus Euclid first defines parallels and shows afterwards that they can be, and the definition of the circle precedes the *postulate* which lays down its possibility thus the astronomers have given names to the concentric and eccentric circles and to the epicycles they have imagined in the heavens without possessing any certainty that the stars actually describe such figures by their motions thus the *Peripatetics have given a name to* that fiery sphere whose truth it would be difficult to demonstrate

This is why when I wished to oppose Father Noël's decision which excluded the vacuum *from nature I thought that I could not enter upon this attempt or* even say a word about the matter until I had declared what I understood by the word *vacuum*, to which I felt myself the more obliged by certain passages in Father Noël's first letter from which I judged that his notion of the vacuum was not in conformity with mine I saw that he was unable to distinguish between dimensions and matter, between immateriality and non-being and that this confusion made him conclude that when I attributed to the apparently empty space length breadth and depth, I committed myself to saying that it was a body, and that from the moment I made it immaterial I reduced it to nothing To untangle all these ideas I stated this definition for him in which he can see that what we conceive and express by the words *empty space* holds the mean position between

material substance and nothingness without participating in either that it differs from non being by having dimensions and that its non resistance and immobility distinguish it from matter so that it keeps between these two extremes without losing itself in either

Toward the end of his letter Father Noel gathers together into one sentence all his objections to make them stronger by uniting them His words are *this space which is neither God nor creature neither mind nor body neither substance nor accident which transmits light without being transparent which resists without resistance which though immobile is moved with the tube which is everywhere and nowhere which does everything and nothing These are the wonderful qualities of void space as space it exists and performs miracles as void it is nothing and does nothing as space it has length breadth and depth as void it excludes length breadth and depth If desired I shall show that all these fine properties follow necessarily from a void space*

Since a long series of fine things is fatiguing in the end by its very length I think Father Noel grew weary on this occasion from having given birth to so many and that foreseeing a like fatigue on the part of his readers he wanted to descend from a graver to a less serious style to refresh them with a little raillery in order that after having supplied them with so many things calling for the effort of admiration he might give them of his charity something for amusement I was the first to feel the effect of this benevolence and whoever reads his letter afterwards will experience it too for no one reading what I wrote but will laugh at the inferences Father Noel draws from it and at those antitheses opposed with so nice a care that it is easy to see he was more concerned with making his terms antithetical to each other than conformable to reason and truth

For to take up these objections one by one *this space he says is neither God nor creature* Mysteries having to do with the Divine Nature are too holy for us to profane with our disputes they should be an object of worship for us and not a subject of discourse So that without discussing them in any way I submit my judgment entirely to what they shall decide who have the right to decide

Neither mind nor body It is true that space is neither mind nor body but is space just as time is neither mind nor body but is time and just as time does not cease to be although it is neither of these things so void space may perfectly well be without having to be either mind or body

Neither substance nor accident True if we understand by the word *substance* what is either mind or body For in this sense space will be neither substance nor accident but will be space just as in this same sense time is neither substance nor accident but is time because in order to be it is not necessary to be either substance or accident certain of the Jesuits maintaining that God is neither one nor the other although he is the Supreme Being

Which transmits light without being transparent These words are so lacking in light that they are dark to me For I do not understand what meaning the word *transparent* has for F[illegible] oel since he finds [illegible] nnot be said of void space For
if like all op[illegible] nderstands by tr[illegible] the absence of any hindrance
to the pass[illegible] I do not see w[illegible] es it to our space which lets
light pass fr[illegible] speaking on[illegible] with my small knowledge I
should hav[illegible] that the word[illegible] *ht* which belong only to his
wa[illegible] of ima[illegible] ean the same[illegible] a[illegible] *ansparent* that is,
[illegible] ob[illegible] in which I[illegible] bs[illegible] r contradiction

It resists without resistance Since he judges of the resistance of this space only by the fact that it takes time for bodies to move in it, and since we have had so much to say on the nullity of this inference, it will be seen that he is wrong in saying it resists, and it will be found on the contrary that this space does not resist or that it is without resistance, in which I see nothing but what is perfectly conformable to reason

Which though immobile is moved with the tube Here Father Noël shows how little he understands the opinion he wishes to refute, and I should have to beg him to observe in this connection that when an opinion is embraced by a number of learned men, we should not attach importance to objections that appear fatal when they are very easy to anticipate, because we should suppose that those who maintain this opinion are already aware of them, and that since they stick to their opinion in spite of the obviousness of the objections, they have found an answer to them But to examine this difficulty in particular, if these antitheses or contraries had not dazzled his mind as much as they charmed his fancy, he would undoubtedly have noticed that, whatever may seem to be the case, the vacuum is not moved with the tube, and that immobility is as natural to space as motion is to body To make this truth evident we must observe that space in general comprehends all natural bodies, each one of which individually occupies a certain part of it, but that although they are all mobile the space they fill is not For when a body is moved from one position to another, it merely changes place, without carrying with it the place it occupied while at rest In fact what does it do except leave its first immobile place, successively to take up others equally immobile? But the place it quits remains still firm and unshakeable so that either it is filled by another body succeeding that which has gone or it is left empty if no successor presents itself, but whether void or filled, ever equally at rest this vast space, whose immensity embraces the universe, is as stable and immobile in each of its parts as in its totality Therefore I cannot see how Father Noël could maintain that the tube communicates its motion to the void space which offering neither consistency for pushing nor a hold for pulling and without susceptibility to weight or to any attractive force obviously cannot be made to change Father Noël was led astray by the fact that when the tube was carried from one place to another, he saw no change inside it and so he thought the space continued to be the same since it was always like itself But he should observe that the space enclosed by the tube in one position is not the same as the space enclosed by it in the following position and that the tube in the course of its motion continually acquires new spaces, so that the space that was empty in its first position is filled with air when it quits it to take the second, in which it makes void the space encountered whereas this space was filled with air before but both of these spaces alternately filled and void always remain equally immobile Whence it is evident that it is out of the question to believe that the void space changes place and what is strangest is that the substance with which Father Noël fills it is such that according to his own hypothesis it could not be carried by the moving tube for since it would enter and leave the glass through its pores with perfect ease without in any way adhering to it like water in a sieve it is obvious that it would not be carried along with it just as we see that this same tube does not transport light which penetrates it easily and freely and that our [illegible] when exposed to sunlight changes rays when it changes place [illegible]

it to its second place the light which filled it in the first and in different positions it receives different rays as well as divers spaces

Finally Father Noel is amazed that *it should do everything and nothing that it should be everywhere and nowhere that it should exist and perform miracles though not existing that it should have dimensions without having them* If these words have any meaning I confess that I do not understand it therefore I do not consider myself obliged to answer them

There you have Sir Father Noel s objections and the things that shock him in my view But since they are evidence rather of his not understanding my opinion than of his gainsaying it and since he seems to find obscurity rather than error in it I thought he would find its clarification in my letter if he would take the trouble to read it more carefully and that therefore I was under no obligation to answer him since a second reading would sufficiently resolve the doubts arising from the first

With reference to the second part of his letter which is taken up with the changing of his first opinion and the establishing of his second opinion he first states why he denies the vacuum The reason he gives is that the vacuum cannot be perceived by any of the senses whence he takes occasion to say that just as I deny the existence of matter [in the top of the tube] for this reason alone that it gives no sensible indication of its presence and that the mind conceives no necessity for it he can with as much force and more deny the vacuum because it has this in common with the matter that it is perceived by no sense His words are *We say that there is water because we see and touch it we say that there is air in an inflated balloon because we feel its resistance that there is fire because we feel the heat but the true vacuum touches none of our senses*

But I am surprised that Father Noel should compare things so dissimilar and that he should not have observed that as there is nothing so opposed to being as non being or to affirmation as negation we proceed to their demonstration by opposed methods and that what establishes one overthrows the other For what is needed for the knowledge of non being except to know the utter lack of every kind of quality and effect whereas if a single one appeared we would infer on the contrary the real existence of a cause producing it? And then he says *Consider Sir which of us two is the more to be believed you who assert the existence of a space hidden to sense and serving neither art nor nature which you make use of only to decide a very doubtful question* etc

But I leave it to you to decide Sir when we see nothing and the senses perceive nothing in a place which is on firmer ground he who asserts that there is some thing although he perceives nothing or he who thinks there is nothing because he does not see anything

After Father Noel has declared as we have just seen his reason for excluding the vacuum and has found grounds for denying it in that very privation of qualities which so justly gives occasion to others to believe in it and is the only sensible means of proving its existence he now undertakes to show that it is a body To this end he thought up a definition of body expressly conceived to fit our space that he might easily draw his inference from it His words are *I define body as that which is composed of separate parts and I say that every body is space when it is considered between its boundaries and that every other space is body because it is composed of separate parts*

But to show that our space is not void it is not a question here of giving it the name of body, as Father Noël has done, but of showing that *it is a body*, as he claims to have done Not that it is not permissible for him to give to what has separate parts any name that pleases him, but he will win small advantage from this liberty, for the word *body* as a result of his use of it becomes equivocal So that there will be two kinds of things, entirely different and even heterogeneous, *called body one, that which has separate parts, for we shall call that body* following Father Noël, the other, a material substance, mobile and impenetrable, for we shall call that *body* in common parlance But he will not be able to conclude from this nominal resemblance a resemblance of real properties or to show in this way that what has separate parts is the same thing as a material, immobile, impenetrable substance, because it is not in his power to make them agree in nature as well as in name Just as, if he had given to what has separate parts the name *water*, *mind*, or *light*, which he could have done as easily as give it that of *body*, he could not have drawn the conclusion that our space was any of these things Thus when he has called *body* what has separate parts and says as a consequence of that definition, *I say that every space is body*, we should take the word *body* in the sense he has just given it, so that if we substitute the definition in place of the thing defined, which can always be done without changing the meaning of a proposition, it will be found that the conclusion *every space is body* is nothing but *every space has separate parts*, but not *every space is material*, as Father Noël fancied I shall not dwell longer on an inference so patently weak, since I am speaking to an excellent mathematician and since you have as much skill in discovering defects in reasoning as you have strength to avoid them

The Reverend Father Noël going further wishes to show what this body is, and to establish his view he begins with a long discourse in which he claims to prove the continual and necessary mixture of the elements but shows nothing except that some parts of one element are found among those of another and that they are confounded rather by accident than by nature so that it might come about that they would separate without violence and return of themselves to their original unmixed state For the natural mingling of two bodies occurs when their separation makes them change both their name and their nature Such is the mingling of all metals and of all things made up of different elements because when the mercury which enters into the composition of gold has been removed, what remains is no longer gold But in the mixture Father Noël imagines for us we see only a violent confusion of certain vapors scattered in the air which remains there like dust without appearing to enter into the composition of the air, and similarly for the other mixtures And as for that of water and air, which he offers as the best demonstrated and which he says is peremptorily proved by those bellows made by water falling into a chamber almost entirely closed (which you see explained at length in his letter) it is strange that Father Noël has not noticed that the air which he says emerges from the water is nothing but the outside air carried with it by the falling water which [illegible] free to go in by the same opening (wider than the opening from which the water [illegible]) so that the water spreading out as it falls into this opening [illegible] the air it meets and envelops, preventing [illegible] falls [illegible] the impact of its motion [illegible] and unable ever to leave [illegible]

finds free Since it is by this experiment alone that Father Noel proves the mixture of water and air and since the experiment in no way shows it he is found not at all to have proved it

The mixture he least proves and is most concerned with is the mixture of fire with the other elements for all that can be concluded from the experiments of the handkerchief and the cat is that certain of their greasiest and most oily particles catch fire from the friction since they are already so disposed by the heat He then declares it to be his opinion that our space is filled with this fiery matter spread out and intermingled as he supposes without proof in all the elements and extended over the whole universe This is the matter he puts in the tube As for the suspension of the liquid he attributes it to the weight of the outside air In this I was delighted to see him adopting the view of those who have the most penetratingly examined these experiments for you know that the letter written by the great Torricelli to Ricci more than four years ago shows that at that time he already held this opinion and that more and more all our men of science are in agreement and support each other on this point However we are waiting for the confirmation of the experiment which is to be performed on one of our high mountains But I do not hope to hear the results for some time because in answer to letters I wrote more than six months ago I have always been told that the tops of the mountains are inaccessible because of the snow

This then is Father Noel s second opinion and although there seems to be little difference between this matter and the matter he puts in the tube in his first letter it is nevertheless greater than appears as I shall show

In his first view nature abhorred a vacuum and made that horror felt in his second view nature gives no indication of the horror she has of the vacuum and does nothing to prevent it In the first he attributed an attractive faculty to this subtle matter and to all other bodies in the second he does away with all attraction both active and passive Finally he attributed many properties to it in the first of which he deprives it in the second So that if there are several steps in the descent to nothingness this matter is now on the last and it seems there is only some remnant of prejudice that prevents him from throwing it headlong in

But I should like to know from Father Noel how he comes to have such an ascendancy over nature and to exercise so absolute an empire over the subservient elements that they change their properties as he changes his mind and that the universe accommodates its effects to the inconstancy of his intentions I do not understand what blindness can be proof against such light or how any faith can be placed in what oneself causes to be or not to be with such ease

But the chief difference I find between the two opinions is that Father Noel affirmatively asserted the truth of the first and that he proposes the second simply as an opinion This is the influence of my first letter and the chief effect it had on his mind so that just as I had replied to his first opinion that I did not believe it met the conditions necessary for the affirmation of a thing so I shall say to the second opinion that since he offers it only as an idea and since neither reason nor sense bears witness to the matter he establishes I leave him in his opinion as I leave in their opinion those who think there are dwellers in the moon and that in the inaccessible regions about the poles there are men entirely different from ourselves

Thus you see Sir that Father Noel puts in the tube a subtle matter spread

throughout the whole universe, and that he gives to the outer air the force to suspend the liquid Whence it is easy to see that this idea is in no respect different from M Descartes, since Father Noël concurs in the cause of the suspension of the quicksilver as well as in the matter which fills the apparently empty space, as *is seen by his own words on page 6* where he says that this matter, which he calls *subtle air*, is the same as that M Descartes calls *subtle matter* Therefore I have believed myself less obliged to answer him, since I should make my answer to the father of this opinion

As I was writing these last lines Father Noël did me the honor of sending me his book on another subject, bearing the title *The Plenum of the Vacuum* He charged the person who took the trouble to deliver it to assure me there was nothing in it against myself, and that any words that seemed to be harsh were addressed *not to me but to the Reverend Father Valerianus Magni Capuchin* And the reason he gave is that Father Magni affirms the existence of the vacuum, whereas I only profess to oppose those who speak dogmatically on this subject But Father Noël would have acquitted me of this charge better if he had made his testimony as public as the suspicion he had given rise to

I glanced through this book, and I found he has a different idea there, that he puts in our tube a matter close to his first, but attributes the suspension of the quicksilver to a quality he assigns to it which he calls *moving levity* and not to the weight *of the outside air, as in his letter*

To make a little survey of the book in brief compass the title promises in the first place to demonstrate the plenum by new experiments and to confirm it by mine At the beginning of the book Father Noël sets himself up as the defender of nature, and by an allegory, perhaps a little drawn out he conducts a suit at law in which he makes her complain of the belief in the void as of a calumny and without her having imparted to him her resentment or having charged him to defend her, he assumes the office of her advocate And in this capacity he asserts that he will expose the imposture and false depositions of the witnesses against her—this is how he refers to our experiments—and promises to produce witness for witness that is, experiment for experiment and to show that ours have been *badly understood and worse verified But in the body of the book when it is a* question of carrying out these large promises he speaks only to doubt and having given hopes of so high a vengeance, he but brings in guesses instead of convictions For in the third chapter when he wishes to establish that the apparent vacuum is a body he simply says he finds it much more reasonable to say that it is a body When it is a question of showing the mixture of the elements he only adds some very weak things to those he had mentioned in his letter When it is a question of showing that the world is a plenum he gives no proof It is on such empty appearances he establishes his *ether* imperceptible to sense [illegible] levity he attributes to it

What is strange is that Father Noël after having given doubts to suspect his view confirms it by false experiments However he [illegible] them as [illegible] ness that they would be accepted as true [illegible] who has [illegible] he says that the eyes show [illegible] we treat it without eyes (although the eyes show us [illegible]) [illegible] seen none of the experiments he talks about [illegible] known [illegible]

given anything but a faithful account For I prefer to believe that he was himself deceived and not that he wanted to deceive others and the esteem I have for him makes me judge that he was too credulous rather than lacking in sincerity Certainly he has reason to complain of those who told him that a bellows full of this apparent vacuum when quickly opened and closed emits a substance sensible as air and that when a tube filled with quicksilver and this same vacuum is turned upside down the quicksilver falls as slowly in the vacuum as in the air the vacuum retarding its natural motion as much as the air and in short many other things he reports For I assure him on the contrary that the air enters and the quicksilver falls in this vacuum with the utmost impetuosity etc

Finally that you may see Father Noel does not understand the experiments recorded in my printed statement I draw your attention to this point among others I said in the first experiments of mine he gave an account of that a glass syringe with a carefully fitted piston having been completely immersed in water and its opening closed by a finger touching the bottom of the piston (thus obliging the hand and arm to be in the water) only a moderate force is required to draw the piston up and make it separate from the finger without any water coming in (which the philosophers believed could not be done with any finite force) and thereby the finger is felt to be strongly and painfully pulled and the piston leaves an apparently empty space into which it does not appear any body can have entered since it is entirely surrounded by water which could have had no access to it because the opening had been closed and if the piston is drawn higher the apparently empty space becomes greater but the finger is not felt to be more pulled Father Noel thought that the words *is not felt to be more pulled* have the same meaning as *is no more felt to be pulled* whereas according to all the rules of grammar they mean that the finger does not feel a greater pull And since he knows the experiments only through reading them he thought the finger actually no longer felt any pull which is absolutely false for the pull continues to be felt just as before But Father Noel s hypothesis is so accommodating that he demonstrates as a necessary consequence of his principles why the finger no longer feels any pull although it is absolutely false that it does not I think he will be able to give as easily the reason for the opposite by the same principles But I do not know what esteem the judicious will have for his method of demonstration if he proves with equal force the affirmative and the negative of the same proposition

From which you see Sir that Father Noel bases this invisible matter on false experiments in order to explain other experiments he has imperfectly understood And so it was right and proper that he should make use of a matter we would be unable to see and cannot understand to reply to experiments he has not seen and has not understood When he is better informed about them I do not doubt that he will change his mind especially with respect to his moving levity Therefore the reply to this book should be postponed until Father Noel has corrected it and has recognized the falsity of the facts and the imposture of the witnesses he offers in opposition and until he no longer bases his charges against the belief in the vacuum on experiments badly understood and worse verified

While writing these words I have just received a printed notice from Father Noel which overthrows the greater part of his book he withdraws the moving levity of the *ether* and calls back the weight of the outside air to suspend the quick

silver. So that I find it rather hard to refute Father Noël's opinions, since he is more prompt in changing them than one can be in replying to him, and I begin to see that his conduct is very different from mine because he makes his opinions public as fast as they occur to him, but the very fact that they contradict each other is sufficient to show their want of solidity, since the power with which he disposes of this matter is evidence enough that he is its author and consequently that it exists only in his imagination.

All who resist truth suffer from a like inconstancy of thought and they who fall into such variableness are to be suspected of denying truth. Accordingly it is curious to see among the defenders of the plenum the great number of opinions clashing with each other, one supports *ether* (and excludes every other substance), another, the spirits of the liquid [in the tube] to the prejudice of *ether*, another, the air contained in the bodies' pores (and banishes everything else), another rarefied air void of every other body. Finally there are those who, not having dared to place the immensity of God there, have chosen among men a person so illustrious by birth and merit that his mind could be placed there and made to fill the universe. So each of them has all the rest for enemies, and as all conspire to destroy one alone, he necessarily succumbs. But since they only triumph over each other, they are all victorious without a single one of them being able to profit by his victory, because all this advantage comes from their own confusion. So that it is not necessary to fight with them to destroy them, since it is enough to abandon them to themselves, for they make up a body divided against itself whose members opposed to each other rend themselves within, whereas the friends of the vacuum remain in a unity always the same, which by this very fact is so related to truth that it should be followed until truth appears to us openly. For it is not in entanglement and tumult that truth should be sought, it cannot be found apart from that maxim which permits us to decide only about evident things, and which forbids us to affirm or to deny those which are not. This is the just mean and perfect balance that you keep to with such advantage and that I, by a good fortune I can never acknowledge enough, was always brought up in with singular method and more than paternal care.

There you have, Sir, the reasons that have restrained me, reasons I did not think I ought longer to conceal from you. And although it may seem that I write this rather for my own interest than for your curiosity, I hope this doubt will not go so far as yourself, since you know that I have much less uneasiness about these fantastic points of honor than passion to converse with you, and that I find much less charm in defending my opinions than in assuring you that I am with all my heart, Sir, your very humble and very obedient servant.

Pascal

ACCOUNT OF THE GREAT EXPERIMENT CONCERNING THE EQUILIBRIUM OF FLUIDS

Devised by M Pascal

TO COMPLETE THE TREATISE PROMISED BY HIM IN HIS ABRIDGMENT ON THE VACUUM AND CARRIED OUT BY M PERIER ON ONE OF THE HIGHEST MOUNTAINS IN AUVERGNE

WHEN I published my abridgment under the title *New experiments concerning the vacuum* etc in which I had made use of the maxim on the horror of the vacuum because it was universally accepted and because I did not yet have convincing proofs to the contrary I continued to feel certain difficulties which made me seriously doubt the truth of that maxim to clear up these difficulties I thought at that time of the experiment here recorded which would make it possible for me to know with certainty what I ought to believe I have called it the *great experiment on the equilibrium of fluids* because it is the most significant of all the experiments that can be made on this subject in that it shows the equilibrium of air and quicksilver which are the lightest and the heaviest of all fluids known in nature But because it was impossible to carry out the experiment here in Paris because there are only a very few places in France suited to this purpose and because Clermont in Auvergne is one of the most convenient I asked my brother in law M Perier councilor on the Board of Excise of Auvergne to be at the trouble of doing it there It will be seen from the letter I wrote him at that time what my difficulties were and just what this experiment is

COPY OF THE LETTER OF M PASCAL THE YOUNGER TO M PERIER *November* 15 1647

SIR

I would not interrupt the official duties with which you are constantly occupied in order to discuss physical speculations with you if I did not know that they will help to refresh you in your leisure hours and that whereas they would be a burden to others you will find amusement in them I have the less hesitation in doing this as I know the pleasure you take in such conversations This one will be only a continuation of those we have had together about the vacuum You know what the philosophers have thought on this subject all have held as a maxim that nature abhors a vacuum and almost all going further have maintained that she cannot permit it and that she would destroy herself sooner than suffer it Thus opinions have been divided some have been content to say only that she abhorred it and others have maintained she could not suffer it I tried in my abridgment of the *Treatise on the Vacuum* to destroy this latter opinion and I think the experiments I give there are sufficient to make it manifestly clear that nature can and actually does suffer a space as large as we please void of every substance known to us and perceptible to sense I am now trying to examine the truth of the former opinion and to find experiments which will show whether the effects

attributed to the horror of the vacuum should really be attributed to it, or whether they should be attributed to the weight and pressure of the air, for, to tell you frankly what I think, it is hard for me to believe that nature, which is not animate or sensitive, is capable of horror, since the passions presuppose a soul capable of feeling them, and I incline much more to impute all these effects to the weight and pressure of the air, because I consider them only as particular cases of a universal proposition on the equilibrium of fluids which is to constitute the larger part of the treatise I have promised Not that I did not have these same thoughts at the time I wrote my abridgment, but through lack of convincing experiments I did not then dare (and I do not yet dare) depart from the maxim of the horror of the vacuum, and I even used it as a maxim in my abridgment having then no further design than to combat the opinion of those who maintain that the vacuum is absolutely impossible, and that nature would suffer her own destruction rather than the least void space Indeed I do not consider it permissible for us lightly to depart from the maxims we hold from antiquity unless we are constrained by proofs indubitable and invincible But in this case I hold it would be an extreme weakness to have the slightest scruple, and that in fine we should have more veneration for evident truths than obstinate attachment to received opinions I could not give you better evidence of how circumspect I am before giving up ancient maxims than to remind you of the experiment I recently made in your presence with two tubes, one inside the other which demonstrates a vacuum in a vacuum You saw that the quicksilver in the inner tube remained suspended at the same height as in the ordinary experiment, when it was counterbalanced and pressed by the weight of the whole mass of the air and that on the contrary it all fell down without height or suspension when because of the surrounding vacuum it was no longer at all pressed or counterbalanced by any air, which had been removed on all sides You saw afterwards that this height or suspension of the quicksilver increased or diminished as the pressure of the air increased or diminished, and finally that all the different heights or suspensions of the quicksilver were always proportional to the pressure of the air

Certainly after this experiment one might well be persuaded that it is not the abhorrence of a vacuum as we suppose which causes the suspension of the quicksilver in the ordinary experiment, but the weight and pressure of the air which counterbalances the weight of the quicksilver But because all the effects of this last experiment with the two tubes which are explained so naturally by the pressure and weight of the air alone, can yet be explained with some probability by the abhorrence of a vacuum I hold to that ancient maxim resolved however to seek the complete clearing up of this difficulty by a decisive experiment I have thought of one which can of itself suffice to give us the light we seek if it can be carried out accurately It is to perform the ordinary vacuum experiment several times on the same day in the same tube with the same quicksilver now at the bottom and now at the top of a mountain at least 500 or 600 fathoms high to find out whether the height of the quicksilver suspended in the tube will be the same or different in the two situations Doubtless you already see that this experiment will decide the question and that if it happens that the height of the quicksilver is less at the top than at the bottom of the mountain (as I have many reasons for believing it will, although all those who have written on this matter are against me) it will follow necessarily that the weight and pressure of the

air is the only cause of the quicksilver s suspension and not the horror of the vacuum since it is perfectly certain that there is much more air pressing down on the foot of the mountain than on its summit whereas it could hardly be said that nature abhors a vacuum at the foot of the mountain more than at its summit

But as great things are ordinarily found to be accompanied by difficulty I anticipate much of it in the carrying out of this plan which requires that an unusually high mountain be picked out near a city in which there is a person capable of bringing to this test all the necessary accuracy For if the mountain were distant it would be difficult to carry to it the vessels the quicksilver the tubes and many other necessary things and to undertake troublesome journeys as many times as might be required for finding on the mountain tops clear and suitable weather which is not often met with there And since it is as rare to find persons outside of Paris with such qualities as it is to find places satisfying the conditions I counted myself happy on this occasion to have fallen in with both since our town of Clermont is at the foot of the high mountain of the Puy de Dome and since I hope that you will grant me of your goodness the favor of being willing to make the experiment yourself In this assurance I have led all our natural philosophers in Paris to hope that the experiment will be performed and among others the Rev Father Mersenne who has already pledged himself in letters he has written to Italy Poland Sweden Holland etc to communicate the results to the friends he has acquired there by his merit I do not specify the means of carrying out the experiment because I well know that you will omit none of the circumstances necessary for doing it with precision

Only I beg you to do it as soon as you possibly can and to excuse the liberty I am taking which is due to my impatience to learn the outcome of the experiment without which I cannot complete the treatise I have promised the public or satisfy the desire of so many persons who are waiting to hear it and who will be infinitely obliged to you Not that I wish to diminish my gratitude by the number of those who share it with me since I want on the contrary to participate in theirs and thus remain so much the more Sir

Your very humble and very obedient servant

PASCAL

M Perier received this letter at Moulins where he was kept by the king s business so that however great his desire to perform the experiment promptly he was unable to do it until last September

You will see the reasons for this delay the account of the experiment and the precision he brought to it in the following letter which I had the honor of receiving from him

COPY OF THE LETTER OF M PERIER TO M PASCAL THE YOUNGER *September 22 1648*

SIR

At last I have made the experiment you have so long been desiring I would have given you this satisfaction sooner I was prevented as much by the official business I was on in Bourbonnais as because since my arrival snow or mist has so covered the Puy de Dome on which I was to make the experiment that even in this season which is the finest of the year here I had difficulty in finding a day on which it was possible to see the summit of this mountain which is usually in the

midst of clouds and sometimes above them although at the same time it is fine weather on the plain, so that my own and the season s convenience did not meet until the 19th of this month But the success with which I performed the experiment on that day amply consoled me for the petty annoyance of so many delays I had been unable to avoid

I am sending you a full and faithful account, wherein you will see with what precision and care I performed the experiment, to which I also added the precaution of having for witnesses certain persons as learned as irreproachable that the sincerity of their testimony might leave no doubt of the certainty of the experiment

Copy of the account of the experiment by M Perier

Last Saturday, the 19th of this month, was very unsettled nevertheless since the weather seemed pretty good at 5 o clock in the morning and the summit of the Puy de Dôme was fully visible, I decided to ascend the mountain to make the experiment To this end I gave notice of my intention to several persons of condition in the town of Clermont who had asked me to let them know the day when I would go up, of whom some are churchmen and others laymen Among the churchmen were the Very Rev Father Bannier Minim of this city who has several times been Superior, and M Mosnier, Canon of the Cathedral of this city and among the laymen, M Laville and M Begon councilors on the Board of Excise, and M La Porte, doctor of medicine and practitioner in the city all very capable men not only in their professions but also in all good learning with whom I was delighted to carry out this fine project Accordingly on that day at 8 o clock in the morning we were all together in the garden of the Minim Fathers, which is almost the lowest place in the town, where the experiment was begun as follows

First I poured into a vessel sixteen pounds of quicksilver which I had rectified during the three preceding days, and having taken two glass tubes of the same size each four feet long hermetically sealed at one end and open at the other I performed with each of them the ordinary vacuum experiment in the above mentioned vessel and having brought the two tubes together and placed them one against the other without lifting them out of the vessel I found that the quicksilver left in each of them was at the same level 26 inches 3½ lines above the surface of the quicksilver in the vessel I did the experiment in the same place in the same two tubes with the same quicksilver and in the same vessel two more times it was always found that the quicksilver in the two tubes was at the same level and had the same height as the first time

That done I fixed one of the tubes in its vessel as a continuous experiment I marked on the glass the height of the quicksilver and leaving the tube in the same place it had been I asked the Rev Father Chastin one of the religious of the house a man as pious as he is capable who talks very well on these matters to be at the pains of observing from time to time during the whole day whether any change came about And with the other tube and a part of the same quicksilver I went with the above mentioned gentlemen to perform the same experiments on the top of the Puy de Dôme [illegible] above the Minims where it was found that there was left in the tube [illegible] whereas there had been [illegible]

3½ lines and that thus there was a difference of 3 inches 1½ lines which over came us all with wonder and astonishment and so surprised us that for our own satisfaction we wanted to repeat the experiment This is why I did it five times very accurately at different places on the summit of the mountain now inside in the little chapel now outside now in a sheltered spot now exposed to the wind now in fine weather now during the rain and mists which occasionally visited us each time having very carefully eliminated all air from the tube the quicksilver was always found to be at the same height of 23 inches 2 lines which when subtracted from the 26 inches 3½ lines found at the Minims makes the difference of 3 inches 1½ lines Which fully satisfied us

Afterwards while descending the mountain I repeated the same experiment on the way always with the same tube the same quicksilver and the same vessel at a place called *Lafon de l'Arbre* much higher than the Minims yet nearer to them than to the summit of the mountain and there I found that the height of the quicksilver left in the tube was 25 inches I did it a second time in the same place and the said M Mosnier mentioned above had the curiosity to want to perform the experiment himself Accordingly he did it in this same place and the same height of 25 inches was always found which is less than that observed at the Minims by 1 inch 3½ lines and greater than that we had just observed on top of the Puy de Dome by 1 inch 10½ lines a circumstance which increased our satis faction not a little since we saw that the height of the quicksilver decreased as the height of the places increased

Finally on our return to the Minims I found the vessel I had left as a continuous experiment with its quicksilver suspended at the same height at which I had left it 26 inches 3½ lines in which height the Rev Father Chastin who had remained there to observe reported there had been no change during the entire day al though the weather had been extremely variable now clear now rainy now dank with mists and now windy

I repeated the experiment with the tube I had taken to the Puy de Dome in the same vessel with the tube of the continuous experiment I found the quick silver was at the same level in both tubes and at the same height of 26 inches 3½ lines as had been found that morning in this same tube and as it had re mained the whole day in the tube of the continuous experiment

I repeated the experiment again for the last time not only in the same tube I had used on the Puy de Dôme but also with the same quicksilver and in the same vessel I had carried up there and I always found the quicksilver at the same height of 26 inches 3½ lines which had been found in the morning And now we were completely confirmed in the certainty of the experiment

The next day the Very Rev Father Delamare priest of the Oratory and Canon Theologian of the Cathedral who had been present at what had taken place on the morning of the preceding day in the garden of the Minims and to whom I had reported what had happened on the Puy de Dome invited me to perform the same experiment at the foot and on top of the highest tower of Notre Dame de Clermont to find out if there would be a difference To satisfy the curiosity of a man of such distinguished merit who has given all France proofs of his ability I performed on the same day the usual vacuum experiment in a private house situated in the most elevated part of the city 6 or 7 fathoms above the garden of the Minims and on a level with the foot of the tower We found the height of the

quicksilver there was about 26 inches, 3 lines, which is less than that found at the Minims by about ½ line

Afterwards I did the experiment on top of the tower, 20 fathoms above its foot and about 26 or 27 fathoms above the garden of the Minims, I found the height of the quicksilver to be about 26 inches, 1 line, which is less than that found at the foot of the tower by about 2 lines and less than that found at the Minims by about 2½ lines

So that, to repeat and to compare the different elevations of the places where the experiments were performed with the different heights of the quicksilver left in the tubes, it is found

That in the experiment performed in the lowest of the places the quicksilver remained at the height of 26 inches, 3½ lines

In that performed in a place about 7 fathoms higher the height of the quicksilver was 26 inches, 3 lines

In that performed in a place about 27 fathoms higher the height of the quicksilver was 26 inches, 1 line

In that performed in a place about 150 fathoms higher the height of the quicksilver was 25 inches

In that performed in a place about 500 fathoms higher the height of the quicksilver was 23 inches, 2 lines

And consequently it is found that an elevation of about 7 fathoms makes a difference in the height of the quicksilver ½ line

About 27 fathoms 2½ lines

About 150 fathoms *15½ lines, i e, 1 inch 3½ lines*

And about 500 fathoms 37½ lines i e 3 inches 1½ lines

There you have the true account of all the details of this experiment, which all the gentlemen who were present will sign whenever you wish them to

For the rest I must tell you that the heights of the quicksilver were very accurately measured, but those of the places where the experiments were performed were much less so

If I had had the leisure and the facilities I would have taken the altitudes more precisely, and I would even have marked a place on the mountain for each 100 fathoms of elevation and performed the experiment there and marked the differences found in the height of the quicksilver at each of these stations in order to give you the exact difference due to the first 100 fathoms, that due to the second 100 fathoms and similarly of the rest in this way a table could be drawn up which if anyone would go to the trouble of carrying it further might finally lead to certain knowledge of the true size of the diameter of the whole sphere of the air

I do not give up hope of sending you some day these differences for every 100 fathoms as much for our own satisfaction as for their usefulness to the public

If you find any parts of this account obscure I shall be able to clear them up for you by word of mouth in a few days since I am on the point of making a little trip to Paris where I shall assure you that I am Sir

Your very humble and very affectionate servant

Perier

This account [illegible]

that a difference of 6 or 7 fathoms made a difference of about ½ line differences which it was easy for me to test in this city I performed the ordinary vacuum experiment at the top and at the bottom of the Tower of Saint Jacques de la Boucherie whose height is 24 or 25 fathoms I found a difference of more than 2 lines in the height of the quicksilver and afterwards I performed the experiment in a private house 90 steps up where I found an evident difference of ½ line results which agree perfectly with what is said in M Perier s account

All students of nature can make the test for themselves at their leisure

Many consequences can be drawn from this experiment such as

A way of knowing whether two places are at the same level that is equidistant from the center of the earth or which of the two has the greater altitude however far apart they may be even if they should be each other s antipodes which would be all but impossible by any other means

The little certainty there is in the thermometer s indication of degrees of heat (contrary to common opinion) and that its water sometimes rises with increasing heat and sometimes falls with decreasing heat though the thermometer has always remained in the same place

The unequal pressure of the air which at the same degree of heat is always much greater in the lowest places

All these consequences will be unfolded at length in the *Treatise on the Vacuum* along with many others as useful as they are interesting to students

To the Reader

My dear reader the universal consensus of nations and the crowd of philosophers agree in establishing the principle that nature would rather suffer her own destruction than the least void space Some of the most enlightened minds have adopted a more moderate principle for although they have believed that nature abhors the vacuum they have nevertheless thought that this repugnance had limits and that with some violence it could be overcome but no one has yet been found to advance the third principle that nature has no repugnance for the vacuum that she makes no effort to avoid it and that she admits it without difficulty and without resistance The experiments I placed before you in my abridgment do away in my opinion with the first of these principles and I do not see how the second can hold up against the present experiment so that I no longer make any difficulty about adopting the third that nature has no repugnance for the vacuum that she makes no effort to avoid it that all the effects that have been attributed to her horror have their origin in the weight and pressure of the air that it is their sole and true cause and that through ignorance of it this imaginary horror of the vacuum had been made to order in an attempt to account for them It is not on this occasion only that when the weakness of men has been unable to find the true causes their subtlety has substituted imaginary causes to which they have given specious names filling the ears and not the mind Thus it is said that the sympathy and antipathy of natural bodies are efficient causes responsible for many effects as if inanimate bodies were capable of sympathy and antipathy it is the same with antiperistasis and with many other chimerical causes which but give a vain solace to man s hunger to know hidden truths and which far from revealing them serve only to cover up the ignorance of such inventors and to feed that of their followers

It is not however without regret that I depart from opinions so generally re ceived, I only do it constrained by truth, to whose force I yield I resisted these new views as long as I had any excuse for following the old, the maxims I made use of in my abridgment sufficiently witness that But at last the evidence of experiments forces me to quit opinions to which respect for antiquity had held me Accordingly I but quitted them little by little, and only gradually did I give them up, for from the first of these three principles, that nature has an invincible horror of the void, I passed to the second, that she feels horror but not invincibly, and thence I finally came to believe in the third, that nature has no horror of the void

Thus far have I been brought by this last experiment on the equilibrium of fluids, which I would not think I had imparted to you in its entirety if I did not reveal my motives for wanting it tried, this is why I am publishing my letter of last November 15th, addressed to M Perier, who undertook the labor of carrying out the experiment with all the accuracy and precision one could wish It is to him alone that all those who have so long been wanting to know the results are indebted

As by a particular good fortune this universal desire had made the experiment famous before its appearance, I am sure it will not become less celebrated after having been performed, and that it will give as much satisfaction as the expectation of it caused impatience

It would not be right to prolong this impatience and that is why I could not refrain from giving out the experiment in advance, against my earlier intention of not publishing it until the complete treatise (which I promised you in my abridg ment), in which I shall unfold the consequences I have drawn from it and which I had put off finishing until this last experiment, because it is to complete my demonstrations But since the treatise cannot appear at this time I have been unwilling to withhold the experiment longer, as much to deserve more gratitude from you for being in haste as to avoid blame for the wrong I should think I was doing you by a longer delay

TREATISES ON THE EQUILIBRIUM OF LIQUIDS AND ON THE WEIGHT OF THE MASS OF THE AIR

CONTAINING THE EXPLANATION OF THE CAUSES OF DIVERS EFFECTS OF NATURE WHICH HAD NOT BEEN WELL UNDERSTOOD UNTIL NOW AND ESPECIALLY OF THOSE THAT HAD BEEN ATTRIBUTED TO THE HORROR OF THE VACUUM

TREATISE ON THE EQUILIBRIUM OF LIQUIDS

CHAPTER I *That liquids weigh in proportion to their height*

If we fasten to a wall several vessels one as in the first figure another inclined as in the second another very wide as in the third another narrow as in the fourth another only a little tube ending at the bottom in a vessel which is wide but has almost no depth as in the fifth figure and if we fill them all with water up to the same height and make openings of the same size in their bases which we close with stoppers to keep the water in experiment shows that the same force is re quired to prevent the stoppers from coming out for although the amount of water in each vessel is entirely different its height is the same in all and the measure of the force required is the weight of the water contained in the first vessel which is uniform throughout for if this water weighs 100 pounds a force of 100 pounds will be required to hold in each of the stoppers even that in the fifth vessel though the water in it should not weigh an ounce

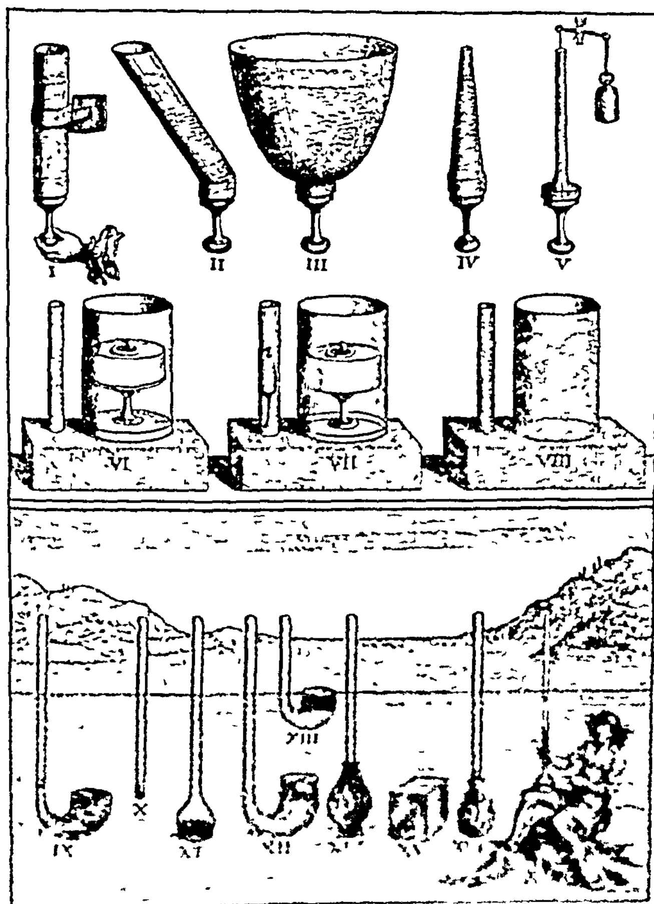
To make an exact test of this we must stop the opening of the fifth vessel with a round piece of wood cased in tow like the plunger of a pump which fits the opening and slides in it with such nicety that it does not stick and yet keeps the water in and we must attach to the center of this piston a cord which is then passed through the small tube and attached to one arm of a balance on the other arm of which we hang a weight of 100 pounds we shall find a perfect equilibrium between this 100 pound weight and the water in the small tube weighing an ounce and however little we take away from the 100 pounds the weight of the water will lower the piston and consequently lower the arm of the balance to which it is attached and lift that from which hangs the weight of a little less than 100 pounds

If the water should freeze and the ice not stick to the vessel (as in fact it ordinarily does not) the other arm of the balance will need only an ounce to counterbalance the weight of the ice but if we apply heat to the vessel so as to melt the ice a weight of 100 pounds will be required to counterbalance the weight of the ice melted to water although we are supposing it to be only an ounce

The same thing would happen if the openings we stop were at the side or even at the top and it would even be easier to make the test that way

Plate I *Figure* VI We must have an entirely closed vessel and make two open ings in the top one very narrow the other wider and solder to each a tube of the same size as the opening and we shall see that if we put a piston in the large tube and pour water in the small tube it will be necessary to put a heavy weight on the

PLATE I



piston to prevent the weight of the water in the small tube from pushing it up just as in the first examples a weight of 100 pounds was required to prevent the weight of the water from pushing the pistons down since the opening was be neath and if it were at the side an equal force would be required to prevent the weight of the water from pushing the piston toward that side

And if the tube filled with water should be a hundred times wider or a hundred times narrower provided the water were always at the same height, the same weight would always be required to counterbalance the water and however little the weight is diminished the water will fall and cause the diminished weight to rise

Rule for the force required to make the water stand

But if we poured water in the tube to twice the height twice the weight would be required on the piston to counterbalance the water and similarly if we made the opening into which the piston fits twice as big it would be necessary to double the force in order to hold down the double piston whence we see that the force required to prevent the water from flowing out is proportional to the height of the water in the tube and not to the area of its base and that the measure of this force is always the weight of all the water contained in a column having the height of the water in the tube and the base of the opening into which the piston fits

What I have said of water is to be understood of every other kind of liquid

CHAPTER 2 *Why liquids weigh in proportion to their height*

It is seen from all these examples that a mere thread of water can counterbalance a great weight it remains to show the cause of this multiplication of force that is what we shall do in the following experiment

Plate I Figure VII New kind of machine to multiply forces

If a vessel full of water closed on all sides has two openings one a hundred times larger than the other with a piston carefully fitted to each a man pressing the small piston will match the strength of a hundred men pressing the piston in the hundredfold greater opening and will overmaster ninety nine

And whatever be the ratio of the openings if the forces applied to the pistons are as the openings there will be equilibrium Whence it is apparent that a vessel full of water is a new mechanical principle and a new machine for multiplying forces to any amount desired since a man by this means will be able to lift any burden proposed

And we must find it wonderful to meet again in this new machine that fixed order which is found in all the old machines such as the lever the wheel the endless screw etc. which is that the distance covered is increased in the same ratio as the force For it is obvious that since one of these openings is a hundred times the other if the man who pushes the small piston drove it down one inch he would push the other up only the hundredth part of an inch for since this pressure is transmitted because of the continuity of the water which joins the two pistons and makes it impossible for one to move without pushing the other it is obvious that when the small piston moves one inch the water which it has pushed pushing the other piston since it finds this opening a hundred times greater occupies only a hundredth part of the height so that distance covered is to distance covered as force to force Which can even be taken as the true cause

of this effect, it being clear that to move a hundred pounds of water one inch is the same thing as to move a pound of water a hundred inches and that thus when a pound of water is so placed with respect to a hundred pounds of water that the hundred pounds cannot move one inch without making the pound move a hundred inches, they must remain in equilibrium, one pound having as much force to make a hundred pounds move one inch as a hundred pounds have to make one pound move a hundred inches

We can also add for greater clarity that the water under these two pistons is equally pressed, for if one piston is a hundred times heavier than the other, it is also in contact with a hundred times as many parts of water, and so each part is equally pressed, therefore all must be at rest because there is not more reason why one part should give way than another, so that if a vessel filled with water has only one opening, an inch in area for example in which we put a piston carrying a weight of one pound, this weight acts against all the parts of the vessel generally because of the continuity and fluidity of the water But to determine how much of this action is felt by each part, the rule is as follows each part an inch in area, like the opening is acted against as if pushed by the weight of one pound (without counting the weight of the water, which I do not mention here for I am considering only the weight of the piston), because the pound weight presses the piston in the opening and each part of the vessel more or less great is acted upon more or less exactly in proportion to its size whether this part is over against the opening or to the side, near or far, for the continuity and fluidity of the water makes all those things equal and indifferent, so that the material of which the vessel is made must have enough resistance in all its parts to hold up against all these pressures, if its resistance is anywhere less, it breaks, if it is greater, the vessel supplies what is necessary, and the rest on this occasion remains useless, so that if a new opening is made in the vessel, there will be required to keep the water from spurting out a force equal to the resistance this part should have that is a force which is to that of one pound as this new opening is to the original opening

Here is another proof which only geometers will be able to follow and which may be passed over by others

I lay down as a principle that a body never moves by its own weight without downward displacement of its center of gravity Whence I prove that the two pistons represented in *Plate I Figure* VII are in equilibrium as follows for their common center of gravity is at the point which divides the line joining their individual centers of gravity in the ratio of their weights let them move now if possible therefore the distances covered will be to each other inversely as the weights as we have shown but if we take their common center of gravity in this second position we shall find it precisely in the same place as before for it will always be found at the point which divides the line joining the [illegible] centers of gravity in the ratio of their weights therefore [illegible] of the lines of the [illegible] will be fo[illegible] joining the centers of gravity in the two positions [illegible] of gravity will be at the same p[illegible] as before [illegible] as a single body have [illegible] the gravity, which is against the p[illegible] they will be at rest [illegible]

By this method I have demonstrated in a little treatise on mechanics the reason for all the multiplications of forces found in all the other mechanical instruments so far invented For I show in all of them that the unequal weights which are in equilibrium by mechanical advantage are so disposed by the construction of the machines that their common center of gravity could never descend no matter what positions they took whence it follows they must remain at rest that is in equilibrium

Let us accept then as certainly true that if in a vessel filled with water and having openings there are forces at these openings proportional to them the forces are in equilibrium this is the foundation and the reason of the equilibrium of liquids of which we are going to give several examples

By this new device of mechanics we understand why liquids weigh according to their height

This device of mechanics for multiplying forces when once understood gives the reason why liquids weigh in accordance with their height and not in accordance with their expanse in all the effects we have recorded

For it is obvious that in *Plate* I *Figure* VI the water in a small tube counterpoises a piston carrying a hundred pounds because the vessel beneath is itself a vessel filled with water having two openings at one of which is the large piston and at the other the water in the tube which is actually a piston carrying its own weight which must counterbalance the other piston if their weights are as the openings

Also in *Plate* I *Figure* V the water in the fine tube is in equilibrium with a weight of one hundred pounds because the vessel at the bottom which is wide and shallow is a closed vessel filled with water having two openings one wide at the bottom where the piston is the other small on top where the fine tube is whose water is actually a piston carrying its own weight and counterbalancing the other because the weights are proportional to the openings for it makes no difference whether the openings are opposite each other or not as has already been said

Wherein we see that the water of these tubes does nothing that copper pistons equally heavy would not do since a copper piston weighing an ounce would be as much in equilibrium with the hundred pound weight as the thread of water weighing an ounce so that the cause of the equilibrium of a small weight with a greater as in all these examples is not that these bodies weighing so little and yet counterpoising much heavier bodies are liquid for that is not common to all the examples since those in which little copper pistons counterbalance such heavy ones show the same thing but it is that the substance in the bottom of the vessels extending from one opening to the other is liquid for that is common to all and is the true cause of the multiplication

Also in the example of *Plate* I *Figure* V if the water in the little tube should freeze and that in the wide vessel beneath remained liquid a hundred pounds would be required to sustain the weight of this ice but if the water in the bottom freezes whether that in the upper tube freezes or remains liquid only an ounce is required to counterbalance it

Whence it is clearly apparent that it is the fluidity of the body joining the two openings which causes this multiplication of forces because its foundation is as we have already said that a vessel filled with water is a mechanical instrument for multiplying forces

Let us pass to other effects whose explanation is discovered by this machine

CHAPTER 3 *Examples of the equilibrium of liquids with their explanation*

Plate I, *Figure* VIII If a vessel filled with water has two openings, in each of which a tube has been soldered, and if we pour water in both up to the same height it will be in equilibrium

For since the heights are the same, the water will be proportional to the surface, that is, to the opening, therefore the water in each tube is really a piston whose weight varies as the opening, therefore there will be equilibrium by the preceding demonstrations

Thence it is that if we pour water in one of these tubes only it will make the water in the other rise until the same height has been reached in both and then there will be equilibrium, for then they will be two pistons whose weights are proportional to the openings

Why water rises as high as its source

This is the reason why water rises as high as its source

(The following experiments require that the vessel be filled up to the mouth of the tubes with the heavier of the liquids)

But if we put different liquids in the tubes, as water in one and quicksilver in the other, the two liquids will be in equilibrium when their heights are proportional to their weights that is to say, when the water is fourteen times higher than the quicksilver, because quicksilver as such is fourteen times heavier than water, for they will be two pistons, one of water, the other of quicksilver, whose weights will be proportional to the openings

And even if the tube filled with water should be a hundred times finer than the tube filled with quicksilver, this thread of water would hold in equilibrium all that great mass of quicksilver, provided the water were fourteen times higher

All that I have heretofore said of tubes should be understood of any vessel whatsoever, regular or not for we meet with the same equilibrium so that if instead of the two tubes we have represented at the two openings we should attach two vessels also emptying into these openings but wide in some places narrow in others, and in short entirely irregular in their whole length and pour liquids in them until they had the specified height these liquids would be as much in equilibrium in these irregular tubes as in the uniform tubes because liquids weigh only according to their height and not according to their expanse

This could easily be demonstrated by inscribing in both vessels many [illegible] small tubes for it would be shown by what we have demonstrated that two of these inscribed tubes corresponding to each other one in each vessel are in equilibrium therefore all those in one vessel would be in equilibrium with all those in the other Those who are used to the inscriptions and circumscriptions of geometry will have no trouble in understanding this and it would be very difficult to demonstrate it to others at least geometrically

Plate I, *Figure* IX If we place in a [illegible] [illegible]

height it will remain suspended for the weight of the quicksilver which weighs inside the tube will be in equilibrium with the weight of the water weighing out side the tube because the heights of these liquids are proportional to their weights and their areas do not count for equilibrium for the same reason it is also a matter of indifference whether the recurved end is wide or not and whether accordingly little or much water weighs upon it

Also if we lower the tube the quicksilver rises for the weight of the water is greater and if on the contrary we raise it the quicksilver falls for its weight is greater than that of the water and if we incline the tube the quicksilver rises until it has again reached the required height which the inclining of the tube had diminished for an inclined tube has less height than a vertical tube

Plate I *Figure* X The same thing happens in a plain tube that is not recurved for in such a tube open at both ends filled with quicksilver and plunged into a river provided that the upper end emerges from the water if the lower end is fourteen feet from the surface the quicksilver will fall until what is left has a height of only one foot and there it will hang suspended by the weight of the water which is easy to understand for the water in contact with the quicksilver from beneath and not from above tries to push it up as if it were a piston and with so much the greater force as the water has greater depth so that since the weight of the quicksilver makes the same effort to fall that the weight of the water makes to push it up everything remains counterpoised

Also if the quicksilver were not there it is obvious that the water would enter the tube and rise to a height of fourteen feet which is that of its level therefore the foot of quicksilver weighing as much as the fourteen feet of water whose place it takes it is natural that it keep the water in the same equilibrium in which the fourteen feet of water would keep it

But if the tube were thrust so far down in the water that the upper end was submerged then the water would enter the tube and the quicksilver would fall for the water weighing inside as well as outside the tube the quicksilver would lack the necessary counterpoise for its suspension

CHAPTER 4 *On the equilibrium of a liquid with a solid*

I am now going to give examples of the equilibrium of water with solid bodies such as a cylinder of solid copper which can be suspended in the water as follows

Plate I *Figure* XI A very long tube is required say twenty feet which widens at the lower end like a funnel if this lower end is round and has fitted into it a copper cylinder so accurately turned that it can enter and leave the opening of the funnel sliding back and forth there without allowing any water to escape and thus acting as a piston we shall see that if we put the funnel with the cylinder in it in a river making sure that the end of the tube emerges from the water and if holding the tube with the hand we abandon the copper cylinder to its fate this solid cylinder will not fall but will remain suspended because the water is in con tact with it from beneath and not from above (for it cannot get into the tube) and thus the water pushes it up in the same way it pushed the quicksilver in the preceding example making the same effort as the weight of the copper makes to fall and thus the opposed forces are in equilibrium To be sure for this result the cylinder must be far enough beneath the surface of the water to give the water the depth necessary for counterbalancing the copper so that if the cylinder is a foot

in height, there must be nine feet from the surface of the water to the bottom of the cylinder, because copper as such has nine times the weight of water; accordingly if the water is too shallow, as would be the case if the tube were drawn up toward the top of the water, the cylinder's weight wins out and it falls. But if the tube is thrust further down than is required, say twenty feet, so far is the cylinder from being able to fall by its own weight that on the contrary we should have to employ a great force to separate it and pull it away from the funnel, for the weight of the water pushes it up with a force of twenty feet. But if we pierce the tube and the water, entering, weighs upon the cylinder from above as well as from below, then the cylinder will fall of its own weight, like the quicksilver in the other example, because it no longer has the counterweight needed for its suspension.

Plate I, Figure XII. If this tube which we have just described is curved over and a wooden cylinder is introduced and the whole is put into water, but in such a way that the upper end emerges, the wood will not rise, although it is surrounded by water, but on the contrary it will sink down into the tube because the water is in contact with it from above and not from below, for the water cannot enter the tube, and thus it pushes the cylinder down with all its weight and not at all up, for it is not in contact with it from below.

Plate I, Figure XIII. But if the cylinder were flush with the water, that is, if it were only sunk in such a way that there was no water above it but also none of it above the water, then it would be pushed neither up nor down by the weight of the water, which would be in contact with it neither from above nor from below (since it cannot enter the tube), but only on all sides; accordingly the cylinder would not rise for nothing lifts it, and on the contrary it would fall, but by its own weight only.

But if the lower end of the tube were bent to one side like a crutch and a cylinder were put in and the whole immersed, still in such a way that the upper end is out of the water, the weight of the water will push the cylinder laterally into the tube, because the water is not in contact with it on the opposite side, and the water will act in this way with so much the more force as it has more depth.

Chapter 5. *Of bodies entirely immersed in water.*

Plate I, Figure XV. We see from the above that water pushes up bodies it is in contact with from below, that it pushes down those it is in contact with from above, and that it pushes to one side those it is in contact with on the opposite side; whence it is easily concluded that when a body is entirely immersed in water, since the water is in contact with it from above, from below, and on every side, it tries to push it up, down, and sideways in every direction. But since its depth is the measure of the force it exerts in all these efforts, it is easy to see which of them must prevail.

For it is apparent at once that since the water has the same depth with respect to all the lateral surfaces, it will push them equally, and accordingly the body will receive no lateral impulse in any direction, any more than a weathervane between two winds of equal strength. But since the water is deeper at the lower surface of the body than at the upper, it is obvious that it will push it more up than down, and since the difference between the two levels of the water is the height of the body itself, it is easy to understand that the water pushes it more

up than down with a force equal to the weight of a volume of water equal to the body

A body in water is counterpoised by an equal volume of water

So that a body in water is carried there as if in the pan of a balance whose other pan carried an equal volume of water

Hence it comes about that some bodies sink

Whence it is apparent that if the body is of copper or some other substance heavier than an equal volume of water it sinks for its weight wins out against that counterbalancing it

Others rise

If the body is of wood or some other substance lighter than an equal volume of water it rises with as much force as its weight is exceeded by the weight of water

Others neither rise nor sink

And if the body has the same weight as water it neither sinks nor rises like wax which stays in water almost where it is put

This is the reason why a well bucket is not hard to pull up so long as it is in the water and why we do not feel its weight until it begins to come out just as a bucket filled with wax would not be more difficult to pull up while it was in the water but when they are in the water they have a counterpoise which they no longer have when they have been drawn out just as a balance pan carrying a hundred pounds is not hard to lift if the other pan is equally laden

Copper weighs more in air than in water

This is why when copper is in water we find that it is less heavy precisely by the weight of a volume of water equal to its own so that if it weighs nine pounds in air it weighs but eight in water because the equal volume of water counter balancing it weighs a pound and in sea water it weighs less because sea water is almost one forty fifth heavier

Two bodies which are in equilibrium in air are not in equilibrium in water

For the same reason two bodies one copper the other lead of equal weight and consequently of different volume (since the same weight requires more cop per) will be found to balance each other in the scales but if the scales are put in water the equilibrium is lost for each body being counterbalanced by a vol ume of water equal to its own and the volume of the copper being greater than that of the lead the copper has a greater counterpoise and accordingly the weight of the lead is the master

Nor even in moist air

Thus two weights of different material having been perfectly balanced with the greatest precision to which men can attain if they are in equilibrium when the air is very dry they are no longer so when the air is moist

All bodies in water are pushed up by its weight not down

By the same principle when a man is in water so far is the weight from pushing him down that on the contrary it pushes him up br more than it and that is why he goes down but w violence than in air because he d by a volume of his own which weighs almost does and if it he would float And so by k or making the against the water he rises and baths a man and if he is pushed down he r

For the same reason a man bathing in a tub lifts his arm without effort as long as it is in the water, but when he thrusts it out of the water, he feels that it is heavy because it is no longer counterbalanced by a volume of water equal to its own, as it was in the water

How it is that bodies float

Finally bodies which float on the water weigh exactly as much as the water whose place they occupy, for the water, in contact with them from below and not from above, only pushes them up

And this is why a lead plate convex in shape floats, because it occupies a large place in the water because of this shape, whereas if it were a solid mass, it would never occupy more than the place of a volume of water equal to the volume of its matter, which would not suffice to balance it

CHAPTER 6 *On compressible bodies in water*

It is seen from everything I have shown how water acts against all bodies in it, pressing them on every side, whence it is easy to judge that if a compressible body is submerged, the water should compress it inward toward the center, and that is exactly what it does, as will be seen in the following examples

Plate I, *Figure* XIV If a bellows with a very long tube, say twenty feet, is placed in water in such a way that the nozzle emerges, it will be hard to open, if the little holes which are in one of the wings have been stopped, whereas it would be opened without any trouble if it were in the air, because the water compresses it from every side with its weight, but if all the necessary force is employed and it is opened, however little this force is relaxed, the bellows closes again with violence (whereas it would remain wide open if it were in air) because of the weight of the mass of water pressing against it Also the deeper it is in the water the more difficult it is to open because there is a greater depth of water to support

Plate I, *Figure* XVI Similarly if we put a tube in the opening of a balloon and bind the balloon about the end of the tube, which is twenty feet long, pouring quicksilver in the tube until the balloon is full and putting the entire apparatus in a cistern of water, so that the end of the tube emerges from the water, we shall see the quicksilver rise from the balloon into the tube, up to a certain height, because since the weight of the water presses the balloon from all sides, the quicksilver it contains, being pressed equally at every point except where the tube enters (for the water has no access there since the mouth of the tube is above the surface of the water), is pushed from the places where it is pressed toward the place where it is not pressed, and thus it rises in the tube up to a certain height at which it weighs as much as the water outside the tube

Wherein the same thing happens as if we pressed the balloon between the hands for we should without difficulty make the liquid in it rise in the tube and it is obvious that the surrounding water presses it in the same way

Plate I *Figure* XVII It is for the same reason that if a man puts the end of a glass tube twenty feet long on his thigh, and if, holding it there he seats himself in a tank filled with water so that the upper end of the tube emerges from the water, his flesh will swell where the mouth of the tube is and a large and painful tumor will be formed as if the flesh were sucked and drawn by a cupping glass, because the weight of the water compressing his body from all sides except the place where the mouth of the tube is (which the water cannot reach because the

tube into which i cannot enter prevents its getting there) the flesh is pushed from the places where it is compressed to the place where it is not and the greater the depth of water the larger the swelling and when the water is withdrawn the swelling goes down and similarly if water is poured into the tube for the weight of the water affecting this part of the body as well as the others there is no more swelling there than elsewhere

This effect is perfectly conformable to the preceding one for the quicksilver in the one case and the man s flesh in the other since they are everywhere pressed except at the mouth of the tube are pushed into the tube as much as the force of the water s weight can push them

If we put in the bottom of a tank filled with water a balloon in which the air is not under much pressure we shall see that it will be noticeably compressed and in proportion as the water is removed the balloon will gradually expand because the weight of the mass of the water which is above it presses it on all sides toward the center until the spring of this compressed air is as strong as the weight of the water pressing the balloon

If we put at the bottom of the same tank of water a balloon filled with air at high pressure we shall not notice any compression not that the water does not press it for the contrary is apparent from the other balloon and from the one containing quicksilver from the bellows and from all the other examples but the water has not enough force to compress it noticeably because it was already very much compressed just as when a spring is very stiff like that of a crossbow it cannot be noticeably bent by a moderate force which would bend a weaker spring perfectly noticeably

We must not be surprised that the weight of the water does not noticeably compress this balloon and that nevertheless we very considerably compress it merely by laying our finger on it although we press it then with a force less than that of water The reason for this difference is that when the balloon is in the water the water presses it on all sides whereas when we press it with the finger it is pressed in one place only but when we press it with the finger in one place only we make a large dent inasmuch as the neighboring parts are not pressed and thus easily accommodate what is expelled from the part that is pressed so that since the matter driven from the one place that is pressed is distributed to all the rest each place has little to take care of and thus there is a dent in that place which becomes very noticeable by comparison with all the surrounding parts which are without it

But if we succeeded in pressing all the other parts as well as that one each part giving back what it had received from the first the first would return to its original state because the rest would themselves be pressed as well as it and as there would now be only a general compression of all parts towards the center we should no longer see a compression in any particular place and we should not be able to judge of the general compression except by a comparison of the two spaces occupied by the balloon and as they would differ very little it would be impossible to notice it Whence we see how much difference there is between pressing one part only and pressing all the parts generally

It is the same with a body every part of which is pressed save one for a swelling occurs there from the emptying as it were of the others as could be seen in the example of the man in the water with a tube on his thigh Also if we press the

same balloon between the hands, although we try to touch each of its parts, there will always be one which escapes between the fingers and swells out into a tumor, but if it were possible to press the balloon everywhere equally, we should never be able noticeably to compress it, whatever effort we made, provided the air in the balloon were already under considerable pressure, this is what happens when it is in the water, for the water is in contact with it on all sides

CHAPTER 7 *Of animals in water Why they are not noticeably compressed by the weight of the water*

All this reveals to us why water does not compress the animals in it, although it presses generally all bodies it surrounds, as we have shown by so many examples For it is not that the water does not press them but as we have already said, since it is in contact with them on all sides, it can cause neither swelling nor depression in any particular part but only a general condensation of all the parts toward the center, which would not be noticeable unless great and which can only be extremely slight because flesh is very compact

For if the water were in contact with a body in one part only or if it were in contact with it in all but one, provided the body were at a considerable depth, the result would be very noticeable, as we have shown, but since all parts are equally pressed, nothing is seen

Why the weight of the water is not felt

It is easy to pass from this to the reason why animals in water do not feel its weight

For the pain we feel when something presses us is great if the compression is great, because the part compressed is drained of blood, and the flesh, the nerves, and the other parts composing it are pushed out of their natural place, and this violence cannot occur without pain But if the compression is slight, as when the skin is grazed by the finger with such delicacy that the blood is not driven from the part touched and that neither the flesh nor the nerves are displaced or in any way altered, there can also be no sensible pain, and if we are touched in this way in every part of the body, we should feel no pain from so slight a compression

And this is what happens to animals in water, for the weight compresses them, to be sure, but so little that it is by no means noticeable, for the reason we have given, so that no part being pressed or drained of blood, no nerve or vein or fleshy part being displaced (for since the whole body is equally pressed, there is no more reason why they should be pressed toward one part than toward another) and everything remaining in short without change, everything should remain without pain and without awareness

And we should not be surprised that these animals do not feel the weight of the water and that nevertheless they would certainly feel the weight of our finger if we only rested it on them, although they were thereby pressed with less force than by the water, for the reason for this difference is that when they are in water, they are pressed on all sides generally, whereas when they are pressed with the finger, they are pressed in one place only But we have shown that this difference is the reason why they are quite noticeably compressed by the tip of the finger and are not noticeably compressed by the weight of the water, even if it should be increased a hundredfold, and as sensation is always proportional to compres

sion this difference is the reason why animals feel the pressure of the finger and not the weight of the water

And thus the true reason why animals in water do not feel its weight is that they are equally pressed from all sides

Also if we put a worm in dough even though we should press the dough be tween our hands we could never crush the worm or even injure it or compress it because we would be pressing it in all its parts The following experiment will serve as proof We must have a glass tube closed at the lower end and half filled with water into which we put three things a little balloon half filled with air a second balloon entirely filled with air and a fly (for it lives in lukewarm water as well as in air) and we must put a piston into the tube which will go as far as the water If we press the piston with whatever force we like as by putting a large number of weights on top of it the water thus pressed will press everything it contains accordingly the soft balloon will be quite noticeably compressed but the hard balloon will be no more compressed than if there were nothing pressing it nor the fly either which will feel no pain under this great weight for we shall see it free and lively walking along the glass and even flying away as soon as it is released from this prison

No special brilliance is needed to draw out of this experiment everything we had already demonstrated

We see the weight presses all these bodies as much as it can

We see that it compresses the soft balloon consequently it also presses the one beside it for the same reason holds for both But we see that no compression appears

Whence then comes this difference? Whence could it come except from the single thing in which the two balloons differ which is that one is filled with compressed air which has been forcibly pumped into it whereas the other is only half full and thus the slack air which is in one is capable of great com pression but not the air in the other because it is very compact and the water which presses it surrounding it on all sides can make no perceptible impression on the balloon which makes an arch against it on all sides?

We also see that the fly is not compressed Why except for the same reason the balloon filled with air is not? And finally we see it feels no pain for the same reason.

But if we put dough instead of water in the bottom of the tube and the balloon and the fly in the dough and put the piston on top and pressed it the same thing would happen

Therefore since the condition of being pressed on all sides makes it impossible for the compression to be either noticeable or painful must we not agree that this is the sole reason why the weight of the water cannot be felt by animals in it?

Let it no longer be said then that the reason is that water does not weigh upon itself for it weighs everywhere the same or that it weighs in a different fashion from solid bodies for all weights are of the same nature and here is a solid weight that a fly supports without feeling it

And if anyone is still not satisfied let the piston be removed and let water be poured into the tube until the water taking the piston s place weighs as much as the piston itself it cannot be doubted that the fly will no more feel the weight of the water than that of the piston Whence comes then this insensibility to so

great a weight in these two examples? Is it because the weight is water? No, for when the weight is solid, there is the same insensibility Let us say then that it is only because the fly is surrounded by water, for that alone is common to the two examples, accordingly it is the true reason

Also if it happened that all the water above the fly should freeze, provided there was left a little above it unfrozen and that thus it was entirely surrounded by water, it would no more feel the weight of this ice than it did the weight of the water before

And if all the water in the river should freeze except for about a foot at the bottom, the fish swimming there would no more feel the weight of that ice than the weight of the water into which it would later melt

And thus animals in water do not feel its weight, not because it is only water that weighs down on them but because it is water that surrounds them

TREATISE ON THE WEIGHT OF THE MASS OF THE AIR

CHAPTER 1 *That the mass of the air has weight, and that it presses with its weight all the bodies it surrounds*

No one denies today that the air is heavy We know that a balloon weighs more when inflated than when empty, which is sufficient proof, for if the air were light, the more of it we put in the balloon the more levity the whole would have, for the whole would have more than a part would have, but since on the contrary the more air we put in the heavier the whole is, it follows that each part is itself heavy and consequently that the air is heavy

Those who want longer proofs have only to look them up in the authors who have expressly dealt with this matter

If it be objected that air is light when it is pure but that the air which surrounds us is not pure air because it is mixed with vapors and gross bodies, and that it is only because of these foreign bodies that it is heavy, I reply in a word that I do not know pure air and that it might be hard to find, but I speak in this treatise only of the air as it exists in the state in which we breathe it, without considering whether it be composite or not, and it is that body, simple or composite which I call air and of which I say that it is heavy a fact which cannot be denied, and that is all I require in what follows

This principle laid down, I shall stop only to draw certain consequences

1 *Since each part of the air is heavy, it follows that the whole mass of the air* (that is, the whole sphere of the air) is heavy and since the sphere of the air is not infinite in its extent, since it has limits, so also the weight of the mass of all *the air is not infinite*

2 Just as the mass of the water of the sea presses with its weight the earth beneath it, and just as if it covered the whole earth instead of a part of it only, *it would press with its weight the whole surface of the earth* so since the mass of the air covers the entire surface of the earth, this weight presses its every part

3 Just as the bottom of a bucket containing water is more pressed by the weight of the water when the bucket is full than when it is half full and is the more pressed the deeper the water so high places like mountain tops are not so pressed by the weight of the mass of the air as are low places like valleys, because there is more air above the valleys than above the mountain tops for all the air

alongside the mountain weighs on the valley and not on the summit because it is above the one and below the other

4 Just as bodies in water are pressed on all sides by the weight of the water above as I have shown in the *Treatise on the equilibrium of liquids* so bodies in the air are pressed on all sides by the weight of the mass of the air above

5 As animals in water do not feel its weight so for the same reason we do not feel the weight of the air and as we could not conclude that water has no weight from our not feeling it when we are immersed in it so we cannot conclude that air is not heavy because we do not feel it to be so We have shown the reason for this in the *Equilibrium of liquids*

6 Just as if we had got together a great heap of wool twenty or thirty fathoms high this mass would be compressed by its own weight and the bottom part would be much more compressed than the middle part or the part near the top because it would be pressed by a greater amount of wool so the mass of the air which like wool is a compressible and heavy body is compressed by its own weight and the air on the bottom that is in low lying places is much more compressed than that higher up as on mountain tops because it carries a greater weight of air

7 Just as if we took a handful of that mass of wool from the bottom in its compressed state and keeping it still compressed in the same way put it in the middle of the mass it would of itself increase in size since it was nearer the top because it would have to carry the weight of a lesser amount of wool there so if we contrived in some way to take air as it is down here and compressed as it is to the top of a mountain it would have to increase in size of itself and attain to the condition of the air surrounding it on the mountain top because it would carry a lesser weight of air in this place than below Consequently if we took a balloon only half filled with air and not entirely inflated as they usually are and carried it up a mountain it should be more inflated on the mountain top and should increase in size in proportion to its being less pressed and the difference should be perceptible if the weight of the quantity of air alongside the mountain from which it is freed is considerable enough to cause a sensible effect and difference

These consequences are so necessarily bound up with their principle that the one cannot be true without the others being equally so and since it is certain that the air reaching from the earth to the top of its sphere has weight all our conclusions therefrom are equally true

But however certain we find these conclusions it seems to me that everyone even though accepting them would want to see the last consequence confirmed by experiment because it contains both all the rest and its own principle for it is certain that if we saw a balloon as described above expand as it is carried higher we could not possibly doubt that this expansion came from the fact that the air in the balloon was more pressed below than above since there is nothing else that could cause it to expand it being even colder on the mountain tops than in the valleys and this compression of the air in the balloon could have no other cause than the weight of the mass of the air for the air was taken as it was in the low altitude and was not compressed since the balloon was even soft and only half filled Consequently this would absolutely prove that the air is heavy that the mass of the air is heavy that it presses with its weight all the bodies it surrounds that it presses low lying places more than high places that it is itself

compressed by its own weight, that the air is more compressed below than above And since in physics experiments have much more force of persuasion than arguments have, I do not doubt that everyone would want to see the latter confirmed by the former

But if the experiment were made, I should have this advantage that in case there occurred no difference in the inflation of the balloon on the highest mountains, that would not invalidate my conclusion, because I could say they are not yet sufficiently high to cause a perceptible difference, whereas if there should be a very considerable difference, as of one eighth or one ninth, certainly the experiment would be decisive in my favor, and there could no longer be any doubt of the truth of everything I have established

But I must say at once without further delay that the test has been made, and successfully, as follows

Experiment made in two places, differing in altitude by about 500 fathoms

If we take a balloon half filled with air, flaccid and soft, and carry it at the end of a string up a mountain 500 fathoms high, it will expand of itself as we go up, and when we are at the top, it will be entirely full and rounded out as if we had blown in more air, and as we go down again, it will little by little lose its roundness, passing through the same degrees, so that when we reach the bottom, the balloon will have returned to its original state

This experiment proves conclusively everything I have said about the mass of the air, and it was necessary to establish that firmly, since it is the foundation of the whole discourse

It only remains to point out that the mass of the air is heavier at one time than at another, namely, when it carries more vapor or is more compressed by cold

Let us observe then, 1 that the mass of the air is heavy, 2 that its weight is limited, 3 that it is heavier at one time than at another, 4 that it is heavier in certain places than in others, as in valleys, 5 that it presses with its weight all the bodies it surrounds, and presses the more the heavier it is

CHAPTER 2 *That the weight of the mass of the air produces all the effects hitherto attributed to the horror of a vacuum*

This chapter is divided into two sections in the first is an account of the principal effects attributed to the horror of the vacuum, and in the second it is shown that they come from the weight of the air

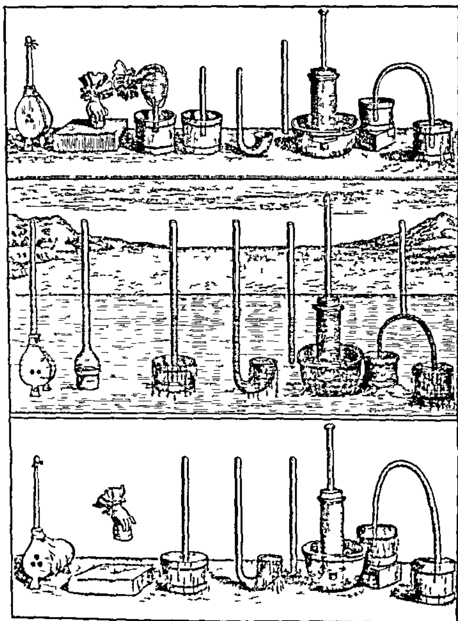
FIRST SECTION *Account of the effects attributed to the horror of a vacuum*

There are certain effects which it is claimed nature produces because of her horror of a vacuum The chief are

1 It is hard to open a bellows whose apertures have been carefully stopped, and if we try to do it, we feel resistance as if its sides were glued together And the piston of a sealed syringe resists when we try to pull it up, as if it were stuck to the bottom

It is claimed that this resistance comes from nature's horror of the vacuum which would be made in the bellows if it could be opened up, which is confirmed by the fact that the resistance ceases as soon as the stoppers are removed and the air can get in to fill the bellows when it is opened

PLATE II



2 Two polished bodies when placed together are hard to separate and seem to adhere

Similarly a hat when put on a table is hard to snatch up

Similarly a piece of leather when put on a paving stone and suddenly lifted, loosens and lifts up the stone

It is claimed that this adhesion comes from nature s horror of the vacuum which would exist during the time it would take the air to get from the edges to the center

3 When a syringe is dipped in water, if the piston is pulled up the water follows and rises as if it adhered to the piston

Similarly the water rises in a suction pump, which is actually nothing but a long syringe, and follows the piston when it is lifted, as if it adhered to it

It is claimed that the rising of the water comes from nature s horror of the vacuum which would be made in the place left by the piston if the water did not rise because the air cannot get in, which is confirmed by this, that if holes are made through which the air can get in, the water no longer rises

In the same way if we put the nozzle of a bellows in water and suddenly open the bellows, the water rises to fill it because the air cannot get in and especially if we stop the air holes in the wing

Similarly when we put our mouth in water and suck, we draw up the water for the same reason, for the lungs are like a bellows, of which the mouth would be the nozzle

Similarly in breathing we draw in the air as a bellows in opening draws in the air to fill up its capacity

Similarly when we put lighted wicks in a saucer filled with water and a glass over them, as the flame of the wicks dies down, the water rises in the glass because the air in the glass, which had been rarefied by the flame, is now condensed by the cold and draws the water up and makes it rise along with itself as it contracts, in order to fill the place it is leaving, just as the piston of a syringe draws the water up with it when we lift it

Similarly cupping glasses draw the flesh and cause a swelling, because the air inside the glass, rarefied by the candle flame, is now condensed by the cold when the flame is extinguished and draws the flesh with it to fill the place it leaves, as it drew the water in the preceding example

4 If we put a bottle filled with water mouth down in a vessel filled with water, the water in the bottle remains suspended without falling

It is claimed that the water does not fall because of nature s horror of the vacuum which would be made in the place left by the water in falling, for the air could not get in, this explanation is confirmed by the fact that if a hole is made through which the air can get in, all the water falls immediately

We can make the same test with a tube, ten feet long say, stopped at the upper end and open at the bottom, for if it is filled with water and the lower end is dipped in a vessel of water, all the water in the tube remains suspended whereas it would fall at once if the top of the tube had been opened

We can do the same thing with a like tube stopped at the top and recurved at the bottom, without putting it in a vessel of water as was done with the other one, for if it is filled with water, this water too will remain suspended whereas if the top were opened, the water would at once spurt out with violence from the recurved end as from a fountain

Finally the same thing can be done with a plain tube without its being recurved provided it be very narrow at the bottom for if it is stopped at the top the water will remain suspended whereas it would fall with violence if we opened the upper end

It is for the same reason that a cask filled with wine does not give up a drop of it though the spigot be open unless we make an opening in the top to admit air

5 *If we fill with water a tube in the shape of an inverted crescent (which is* ordinarily called a siphon) and let each leg dip in a vessel filled with water then unless the two vessels are at exactly the same level all the water in the higher vessel will rise in the leg dipping in it to the top of the siphon and will pass through the other leg into the lower vessel so that if water is constantly supplied to the higher vessel the flow will be continuous

It is claimed that this rising of the water comes from nature s horror of the vacuum which would be made in the siphon if the water in the two legs fell from each into the corresponding vessels as it actually does fall when an opening is made in the top of the siphon through which the air can get in

There are several other like effects I omit because they are all similar to those of which I have spoken and because in all there appears only this that all the contiguous bodies resist the effort made to separate them when air cannot get in between them whether this effort comes from their own weight as in the examples in which water rises and remains suspended in spite of its weight or whether it comes from forces we use to separate them as in the first examples

These are the effects commonly attributed to the horror of the vacuum I am going to show that they come from the weight of the air

SECOND SECTION *That the weight of the mass of the air produces all the effects that have been attributed to the horror of the vacuum*

If we have clearly understood in the *Treatise on the equilibrium of liquids* how liquids act with their weight against all bodies in them we shall have no difficulty in understanding how the weight of the mass of air acting upon all bodies produces all the effects that had been attributed to the horror of the vacuum for they are exactly alike as we shall show in each instance

1 *That the weight of the mass of the air causes the difficulty in opening a bellows with all its apertures stopped*

That it may be understood how the weight of the mass of the air causes the difficulty we experience in opening a bellows when the air cannot get in I shall point out a like resistance caused by the weight of water All that is needed is to recall what I said in the *Equilibrium of liquids* (*Plate I Figure* XIV) that a bellows with a tube of twenty feet or more placed in a tank of water in such a way that the end of the tube emerges from the water is hard to open and so much the harder as the water is deeper which comes obviously from the weight of the water above for when there is no water the bellows opens very easily and in proportion as water is poured in the resistance increases and is always equal to the weight of the water carried by the bellows because since the water cannot get in because the tube is outside we could not open the bellows without lifting and holding up the whole mass of the water for the water displaced by opening the bellows not being able to enter it is forced to go elsewhere and thus to raise the level of the water which cannot be done without effort whereas if the bellows were

broken and the water could get in, we could open and close it without resistance because the water would go in through the breaks as fast as the bellows was opened, and so we could open it without having to lift up the water

I do not think anyone will be tempted to say that this resistance comes from the horror of the vacuum, and it is absolutely certain that it comes from the weight of the water alone

But what I say of water should be understood of any other fluid, for if we put the bellows in a tank filled with wine, we shall feel a like resistance to opening it, and likewise if we put it in milk, in oil, in quicksilver, and in short in any fluid whatsoever It is then a general rule and a necessary effect of the weight of fluids that if a bellows is put in any fluid whatsoever in such a way that it cannot get into the body of the bellows, the weight of the fluid above prevents our opening the bellows without feeling resistance, because we could not do it without holding up the fluid, and consequently, applying this general rule to the particular case of the air, it will be true that when the air is kept from entering a bellows, the weight of the mass of the air above prevents our opening the bellows without feeling resistance, because we could not open it without lifting the whole mass of the air, but as soon as we make an opening in it, we open and close it without resistance because the air can get in and out, and so when we open the bellows, we do not have to lift the mass of the air, which is entirely conformable to the example of the bellows in water

Whence we see that the difficulty in opening a sealed bellows is only a particular case of the general rule concerning the difficulty of opening a bellows in any fluid whatsoever when the fluid has no access to it

What I have said of this effect I shall say of each of the others, but more succinctly

2 *That the weight of the mass of the air is the cause of the difficulty we experience in separating two polished bodies when placed together*

That it may be understood how the weight of the mass of the air causes the resistance we feel when we want to separate two polished bodies that have been placed together, I shall give an example of an altogether similar resistance caused by the weight of the water, which will leave no room for doubt that the air causes this effect

We must here again recall what was set forth in the *Equilibrium of liquids* (*Plate* I, *Figure* XI)

That if we put a copper cylinder turned on a lathe, in the opening of a funnel, also turned on a lathe, so that they fit so perfectly that the cylinder easily enters and slides back and forth in the funnel but without letting any water escape between and if we put this machine in a tank of water in such a way that the stem of the funnel emerges from the water (which stem may have a length of twenty feet if necessary), if with the cylinder at a depth of fifteen feet in the water, holding the funnel with the hand, we let loose the cylinder and abandon it to its fate we shall see that not only will it not fall although it seems there is nothing to hold it up, but even that it will be difficult to pull it out of the funnel although it is in no way stuck to it, whereas it would fall by its own weight with violence if it were at a depth of only four feet in the water, and still more violently if it were entirely outside the water I have also shown the reason for this, which is that the water, in contact with the cylinder from below and not from above (for it

does not touch its upper surface because the funnel keeps it from getting there) pushes it from the side it touches toward the side it does not touch and thus pushes it up and presses it against the funnel

The same thing should be understood of every other fluid and consequently if two bodies are polished and placed together and if we hold the upper one with the hand and let the other go the lower one remains suspended because the air is in contact with it from beneath and not from above for it cannot get in between the two bodies and consequently it cannot reach the surfaces in contact whence it follows by a necessary effect of the weight of all fluids in general that the weight of the air must push this body up and press it against the other so that if we try to separate them we meet with great resistance which is entirely conformable to the effect of the weight of water

Whence we see that the difficulty in separating two polished bodies is only a particular case of the general rule concerning the pressure of all fluids in general when they are in contact with a body on one of its surfaces and not on the opposite surface

3 *That the weight of the mass of the air is the cause of the rise of water in syringes and pumps*

To explain how the weight of the mass of the air makes water rise in pumps as the plunger is lifted I shall show an entirely similar effect of the weight of water which will make the reason perfectly clear as follows

If we fit a syringe with a long piston ten feet say hollow throughout its length with a valve at the lower end so arranged that it opens downward but not upward so that the syringe is incapable of lifting water or any liquid above the level of the liquid because the air can enter it perfectly freely through the hollow piston if now we put the opening of the syringe in a vessel filled with quicksilver and the whole in a tank of water in such a way that the top of the piston emerges from the water when we lift the piston the quicksilver will rise and follow it as if it adhered to it whereas it would not rise at all if there were no water in the tank because the air is entirely free to enter the body of the syringe through the hollow piston

So the fear of the vacuum is not the cause for if the quicksilver did not rise to fill the place left by the piston there would be no vacuum since the air may freely enter but it is only because the mass of the water weighing upon the quicksilver in the vessel and pressing it in all its parts except where the opening of the syringe is (for the water cannot reach there since it is kept away by the body of the syringe and by the piston) the quicksilver pressed in every place but one is pushed by the weight of the water toward that one as soon as the piston by being lifted leaves it a free place to enter and balances in the syringe the weight of the water which weighs on the quicksilver outside

But if holes are made in the syringe so the water can get in the quicksilver will no longer rise because the water enters and is as much in contact with the quicksilver at the mouth of the syringe as elsewhere and thus since all of it is equally pressed none of it rises All this was clearly demonstrated in the *Equilibrium of liquids*

We see in this example how the weight of the water makes the quicksilver rise and we could produce a similar effect with the weight of sand by removing the water from the tank if instead of water we pour in sand the weight of the sand

will make the quicksilver rise in the syringe because it presses, just as the water did, everywhere except at the mouth of the syringe, and thus it pushes the quicksilver and forces it to rise in the syringe

And if we put our hands on the sand and press it, we shall make the quicksilver rise higher inside the syringe and keep on rising to a height at which it can counterpoise the pressure outside

The explanation of these effects makes it very easy to understand why the weight of the air causes water to rise in ordinary syringes as the piston is drawn up, for since the air is in contact with the water in the vessel everywhere except at the opening of the syringe (from which it is kept away by the syringe and the piston), it is obvious that the weight of the air, pressing the water in every place but that one, must push it thither and make it rise, as the piston by being lifted leaves room for it to come in, and counterbalance within the syringe the weight of the air which weighs outside, for the same reason and by the same necessity as the quicksilver rose, pressed by the weight of the water and by the weight of the sand, in the example we have just given

It is then obvious that the rising of water in syringes is only a particular case of the general rule that when a fluid is pressed in every place but one by the weight of some other fluid, this weight pushes it toward the place where it is not being pressed

4 *That the weight of the mass of the air causes water to be suspended in tubes stopped at the upper end*

To make it understood how the weight of the air holds water suspended in tubes stopped at the upper end, I shall point out an entirely similar example of a like suspension caused by the weight of water, which will make the reason perfectly clear

And first it may be said at once that this effect is entirely comprehended in the preceding, for just as I have shown that the weight of the air makes water rise in syringes and holds it suspended there, so the same weight of the air holds water suspended in a tube That this effect may not lack, any more than the rest, another entirely like it to which it may be compared, I shall say that nothing is needed to this end but to remember what was said in the *Equilibrium of liquids* (*Plate* I, *Figure* IX), namely, that a tube ten feet long or more, recurved at the bottom and filled with mercury, having been put in a tank of water so that the upper end emerges from the water, part of the mercury remains suspended inside the tube, that is, at the height where it can counterbalance the water which weighs outside, and that a like suspension takes place even in a tube not recurved simply open at both ends, with the upper end emerging from the water

Now it is obvious that this suspension does not come from the horror of a vacuum, but only from this, that the water, weighing outside and not inside the tube and in contact with the mercury on one side and not on the other, holds it suspended by its weight at a certain height, therefore if the tube is pierced so that the water can get in, straightway all the mercury falls, because since the water is in contact with it everywhere and acting within as well as without the mercury no longer has a counterpoise All this was said in the *Equilibrium of liquids*

Since this is a necessary effect of the equilibrium of fluids it is not strange that when a tube is filled with water, stopped at the top and recurved at the bottom the water remains suspended in it, for the air weighing on the part of the water

at the recurved end and not on the part in the tube (since it is prevented by the stopper) must of necessity hold the water suspended inside to counterbalance its own weight outside exactly as the weight of the water held the mercury in equilibrium in the example we just gave

And similarly when the tube is not recurved for because the air is in contact with the water from below and not from above (since the stopper prevents con tact there) it is absolutely necessary that the weight of the air hold up the water exactly as the water held up the mercury in the example just given and as the water pushes up and holds suspended a copper cylinder it is in contact with from below and not from above but if the stopper is removed the water falls for the air is in contact with the water below and above and weighs inside and outside the tube

Whence we see that the action of the air in holding liquids suspended with which it is in contact on one side and not on the other is a case of the general rule that fluids contained in any kind of tube whatsoever immersed in another fluid which presses them from one side and not from the other are suspended by the equilibrium of the fluids

5 *That the weight of the mass of the air makes water rise in siphons*

To explain how the weight of the air makes water rise in siphons I am going to show that the weight of water makes quicksilver rise in a siphon open at the top so that it is freely accessible to the air whence we shall see how the weight of the air produces this effect This I shall do as follows

If one leg of a siphon is about one foot high and the other about one foot one inch and if we make an opening in the top of the siphon in which we insert a tube twenty feet long and carefully soldered to the opening and if having filled the siphon with quicksilver we put each of its legs in a vessel also filled with quicksilver and the whole in a tank of water fifteen or sixteen feet deep in the water with the end of the tube therefore out of the water then if there is any difference at all in level between the two vessels say an inch all the quick silver in the higher vessel will rise in the siphon to the top and will pass through the other leg into the lower vessel in a continuous flow and if we keep the higher vessel supplied with quicksilver the flow will never cease but if we make an opening in the siphon through which the water can get in immediately the quick silver will fall from each leg into the vessels and water will take its place

This rising of quicksilver does not come from the horror of the vacuum for the air has perfectly free access to the siphon accordingly if we emptied the tank of water the quicksilver would fall from each leg into the corresponding vessel and the air would take its place coming in through the open tube

It is then obvious that the weight of the water causes the quicksilver to rise because the water weighs upon the quicksilver in the vessels and not upon that in the siphon and for this reason the water by its weight forces the quicksilver to rise and to flow as it does but as soon as the siphon has been pierced and the water can enter it no longer makes the quicksilver rise because it weighs inside as well as outside the siphon

But for the same reason and by the same necessity as the water thus makes the quicksilver rise in a siphon when it weighs on the vessels and has no access to the interior of the siphon so also the weight of the air makes water rise in ordinary siphons because it weighs on the vessels in which the legs of the siphon dip and

has no access to the body of the siphon, which is entirely closed, and as soon as an opening is made in the siphon, the water no longer rises, but on the contrary *falls into each* vessel, and air takes its place because then the air weighs inside as well as outside the siphon

It is obvious that this last effect is only a case of the general rule, and that if we really understand why the weight of the water makes the quicksilver rise in the example we gave, we shall see at the same time why the weight of the air makes water rise in ordinary siphons, this is the reason it must be made perfectly clear why the weight of the water produces this effect, and why it is the higher vessel which empties into the lower vessel rather than the other way around

To this end it must be observed that, the water weighing on the quicksilver in each of the vessels and not at all on that in the legs of the siphon dipping in the vessels, the quicksilver in the vessels is urged by the weight of the water to rise in each leg of the siphon all the way up and still higher, if that were possible because *the water is sixteen feet deep and the siphon is only one foot high, and* one foot of quicksilver is equal in weight to only fourteen feet of water, whence it is seen that the weight of the water pushes the quicksilver in each leg all the way up and still has some force left, whence the quicksilver in each leg being pushed up by the weight of the water, they contend at the top of the siphon, *pushing each other, so that the one having the greater force must prevail*

Now that will be easy to calculate, for it is clear that since the water has greater depth above the vessel which is an inch lower, it pushes up the quicksilver in the longer leg more forcibly than that in the other leg by the force which an inch of depth gives it, whence it seems at first the result should be that the quicksilver *should be pushed from the longer leg into the shorter, but we must consider* that the weight of the quicksilver in each leg resists the effort made by the water to push it up, but they do not resist equally, *for since the quicksilver of the long* leg has an inch more of height, it resists more forcibly by the force given it by the height of one inch, therefore the mercury in the longer leg is more pushed up by the weight of the water by the force of an inch of water, *but it is more* pushed down by its own weight by the force of an inch of quicksilver, but an inch of quicksilver weighs more than an inch of water, therefore the quicksilver in the shorter leg is pushed up with more force, and consequently it must rise and continue to rise as long as there is any quicksilver in the vessel in which it dips

Whence it is apparent that the reason why the higher vessel empties into the lower is that quicksilver is a heavier liquid than water The opposite would happen if the siphon were filled with oil and the whole were in the same tank of water for then the oil in the lower vessel would rise and flow through the top of the siphon into the higher vessel *for the same reasons just given, for the water still* pushing the oil in the lower vessel with more force because it has an inch more of depth and the oil in the long leg resisting and weighing more by its extra inch of height, since an inch of oil weighs less than an inch of water, the oil in the long leg would be pushed up with more force than the oil in the other leg and consequently it would flow *and would pass from the lower vessel* to the higher vessel

And finally if the siphon were *filled* with a liquid which had the same weight as the water in the tank, then neither would the water in the higher vessel pass

into the other vessel nor that in the lower pass into the higher but everything would remain at rest for by calculating all the forces we shall see that they are all equal

That is what had to be firmly grasped if we were to have a thorough under standing of why liquids rise in siphons after which it is too easy to see why the weight of the air makes water rise in ordinary siphons and pass from the higher vessel into the lower for us to give more time to it since it is only a case of the general rule we have just given

6 *That the weight of the mass of the air causes the swelling of the flesh when a cupping glass is applied*

To explain how the weight of the mass of the air makes the flesh swell where a cupping glass is applied I shall cite an entirely similar effect caused by the weight of water which will leave no doubt in the mind

It is the effect recorded in the *Equilibrium of liquids* (*Plate* I *Figure* XVII) where I showed that a man applying to his thigh the end of a glass tube twenty feet long and seating himself in this condition at the bottom of a tank of water in such a way that the upper end of the tube emerges from the water his flesh swells at the opening of the tube as if there were suction in that place

Now it is evident that this swelling does not come from the horror of the vac uum for the tube is completely open and the swelling would not occur if there were only a little water in the tank and it is altogether certain that it comes from the weight of the water only because the water pressing the flesh everywhere except at the entrance of the tube (for it finds no access there) drives the blood and the flesh there to make the swelling

And what I say of the weight of the water is to be understood of the weight of any other liquid for if our man seats himself in a tank of oil the same thing will happen as long as that liquid is in contact with every part of his body but one But if the tube is removed the swelling goes down because the water now exert ing its action upon that part as well as on the others there will be no more effect there than elsewhere

This being understood we shall see that when we put a candle on the flesh and a cupping glass over it as soon as the flame is extinguished the flesh nec essarily swells for the air in the cupping glass which was highly rarefied by the flame having become condensed by the cold following upon the extinction of the flame the weight of the air is in contact with the body everywhere except beneath the cupping glass (for there is no access there) and consequently the flesh must swell there and the weight of the air must drive the adjacent blood and flesh which it presses into that part which it does not press for the same reason and by the same necessity that the weight of the water did in the example I gave when it was in contact with the body in every place but one whence it is apparent that the behavior of the cupping glass is only a particular case of the general rule concerning the action of all fluids upon a body with all parts of which they are in contact save one

7 *That the weight of the mass of the air is the cause of the attraction that takes place in suction*

Only a word is now required to explain why when we apply our mouth to water and suck the water comes in for we know that the weight of the air presses the water everywhere except where the mouth is for it is in contact with it every

where except there, and thence it is that when the respiratory muscles, lifting the chest, enlarge the capacity of the interior of the body, the air inside, having more space to fill than before, has less force to prevent the water from entering the mouth than the air outside, which weighs on the water everywhere except in this one place, has force to make it enter

That is the cause of this attraction, which differs in no respect from the attraction of syringes

8 *That the weight of the mass of the air is the cause of the drawing of milk by infants from their nurses breasts*

Similarly a baby with its lips about the nipple of its nurse s breast, when it sucks, draws in milk, because the breast is pressed on all sides by the weight of the surrounding air except in the part which is in the child s mouth, and that is why as soon as the respiratory muscles make more room in the child s body, as has just been said, and nothing is in contact with the nipple of the breast but the air inside, the air outside, which has more force and compresses the breast, pushes the milk through this opening where there is less resistance, which is as necessary and as natural as for the milk to come out when the nipple is pressed between the hands

9 *That the weight of the mass of the air is the cause of the drawing in of air in breathing*

And for the same reason when we breathe, air enters the lungs, because when the lungs open and the nose and all the passages are free and open, the air which is in contact with these passages, pushed by the weight of all its mass, enters and falls by the natural and necessary action of its weight, which is so under standable, so easy, and so simple that it is strange recourse should have been had to the horror of the vacuum, to occult qualities, and to causes so remote and so chimerical, to find a reason, since it is as natural for air to enter and to fall in this way into the lungs when they open as for wine to fall into a bottle when it is poured in

This is the way in which the weight of the air produces all the effects hitherto attributed to the horror of the vacuum I have explained the chief of them, if any remain, it is so easy to understand them after these that I should think I was being both superfluous and tedious if I sought out others to treat in detail, and it may even be said they had all been seen already, as in their source, in the preceding treatise, since all these effects are only particular cases of the general rule concern ing the equilibrium of fluids

CHAPTER 3 *That as the weight of the mass of the air is limited, so the effects it produces are limited*

Since the weight of the air produces all the effects hitherto attributed to the horror of the vacuum, it should be the case that since this weight is not infinite but has limits, its effects too should be limited, which is confirmed by experiment as what follows will show

As soon as we raise the piston of a suction pump or of a syringe, the water follows, and if we continue to raise it the water will keep on following but not to any height whatsoever for there is a certain point it does not pass, which is approximately at the height of thirty one feet so that as long as we only raise the piston to this height, the water rises and remains always in contact with the pis ton but as soon as we raise the piston higher it no longer draws the water with

it but the water remains motionless and suspended at that height without rising further and to whatever height we raise the piston beyond the water lets it go without following it

The cause of which is that the mass of the air weighs approximately as much as water at a depth of thirty one feet so that as it makes the water rise in the syringe because it weighs outside and not inside in order to counterbalance the water it makes it rise to the height at which it has the same weight as it self and then the water in the syringe and the air outside weighing equally the whole is in equilibrium just as water and quicksilver are in equilibrium when their heights are to each other [reciprocally] as their weights as we have so often shown in the *Equilibrium of liquids* and as the water rose only for the reason that the weight of the air forced it to when it has arrived at that height at which the weight of the air can no longer make it rise no other cause moving it it remains at that point

And whatever the size of the pump the water always rises to the same height because liquids do not weigh according to their bulk but according to their height as we have shown in the *Equilibrium of liquids*

But if we draw up quicksilver in a syringe it will rise to a height of two feet three inches and five lines which is precisely the height at which it weighs as much as thirty one feet of water because it will weigh as much then as the mass of the air

And if we draw up oil in a pump it will rise to about thirty four feet and no more because it weighs as much at this height as water at thirty one feet and consequently as much as the air and similarly with all other liquids

A tube stopped at the top and open at the bottom having been filled with water if it has any length we please less than thirty one feet all the water will remain suspended in it because the weight of the mass of the air is capable of holding it there

But if it is longer than thirty one feet the water will fall part way that is until it has a height of only thirty one feet and then it will remain suspended at this height without falling lower just as in the *Equilibrium of liquids* we saw that the quicksilver in a tube placed in a tank of water fell part way until it came to rest at the height at which it weighed as much as the water

But if we were to put in the tube quicksilver instead of water the quicksilver would fall until it came to rest at the height of two feet three inches and five lines which exactly corresponds to thirty one feet of water

And if we slant a little these tubes in which water and quicksilver remain suspended these liquids will rise until they have returned to their former height which was diminished by the slanting because the weight of the air prevails as long as they are below that height and is in equilibrium when they have reached it which is exactly like what is recorded in the *Treatise on the equilibrium of liquids* of a tube of quicksilver immersed in a tank of water and if the tube is straightened the liquids fall again always to return to the same height

Thus in a siphon all the water in the higher vessel rises and passes into the lower vessel as long as the leg of the siphon dipping in it is of any length we please less than thirty one feet because as I have said elsewhere the weight of the air is quite capable of lifting water to this height and holding it suspended there but as soon as the leg dipping in the higher vessel exceeds this length the

siphon no longer works (that is, the water in the higher vessel no longer rises to the top of the siphon to pass into the other vessel, because the weight of the air cannot lift it higher than thirty-one feet), so that the water divides at the top of the siphon and falls in each leg into the corresponding vessel until it comes to rest at the height of thirty one feet above each vessel, and remains suspended at this height by the weight of the air which counterbalances it

If we slant the siphon a little, the water will rise in both legs until it has again reached the height which the slanting had diminished, and if we slant it until the top of the siphon has an elevation of only thirty one feet above the surface of the higher vessel, the water in the leg dipping in that vessel will be at the top of the siphon, so that it will fall into the other leg, and thus the water in the higher vessel always taking its place, there will be a continuous flow, but in a thin trickle only, and if we slant the siphon more, the water will flow at the full capacity of the tube

The same thing must be understood of all other liquids, allowance being made for the ratio of their weights

Thus if we try to open a bellows as long as we do not use more than a certain amount of force, we shall be unable to do it, but if we pass that point, we shall open it Now the required force is as follows if the wings of the bellows are a foot in diameter, there will be needed to open it a force able to lift a vessel filled with water one foot in diameter, like the wings, and thirty one feet high, which is the height to which water rises in a pump If the wings are only six inches in diameter, there will be needed to open the bellows a force equal to the weight of the water in a vessel six inches in diameter and thirty one feet high, and similarly of the rest, so that by hanging to one of the wings a weight equal to that of the water just specified we shall open the bellows, and a lesser weight could not do it, because the weight of the air pressing it is exactly equal to that of thirty one feet of water

The same weight will raise the piston of a sealed syringe, and the same weight will separate two polished bodies placed together, so that if they are an inch in diameter, by applying to them a force equal to the weight of thirty one feet of water one inch in diameter we shall separate them

CHAPTER 4 *That as the weight of the mass of the air increases when it is more laden with moisture and diminishes when it is less laden, so the effects it produces increase and diminish proportionally*

Since the weight of the air causes all the effects we are considering and since that weight is not always the same for the same place but constantly varies according to the humidity, its effects should not be always uniform but on the contrary constantly variable, this is confirmed by experiment, which shows that the measure of thirty one feet of water, which we gave to serve as an example, is not a precise measure always accurate, for water does not rise in pumps exactly to this height and always remain suspended there, on the contrary sometimes it rises to thirty one and a half feet, then returns to thirty one feet, then falls again three inches more, then suddenly rises a foot, following the variations of the air, and all that with the same freakishness with which the air passes from murky to clear

And experiment shows that the same pump lifts water higher at one time than at another by one foot, eight inches So that a pump and for the same reason a

siphon can be made of such a height that at one time they will work and at another time they will not according as the air is more or less laden with moisture or for some other reason weighs more or less which would make a rather interest ing experiment and not too hard if we used quicksilver instead of water for in that way such long tubes would not be needed

Hence we are to understand that water remains suspended in tubes at a lesser height at one time than at another and that a bellows is easier to open at one time than at another precisely in the same ratio and similarly with the other effects for what is said of one applies exactly to all the rest each in accordance with its own nature

CHAPTER 5 *That since the weight of the mass of the air is greater over low places than over high places so the effects produced by it there are proportionately greater*

Since the weight of the mass of the air produces all the effects we are consider ing and since that mass is not the same over every place on the earth because it is greater over the lower places the effects should be different there too as indeed experiment confirms showing that the measure of thirty one feet I had taken as an example is not the height to which water rises in pumps everywhere in the world for it rises to different heights in all places not at the same level (the lower the altitude the higher the water rises and the higher the altitude the lower the water rises) so that by experiments made in places differing in altitude by five or six hundred fathoms a difference of four feet three inches has been found so that the same pump which lifts water in one place to a height of thirty feet four inches lifts it under the same atmospheric conditions in another place some five hundred fathoms higher only to a height of twenty six feet one inch which constitutes a difference of one sixth

The same thing should be understood of all the other effects each in its own fashion that is to say for example that two polished bodies are more difficult to separate in a valley than on a mountain top and so on

But as five hundred fathoms of altitude cause four feet three inches difference in the height of the water lesser altitudes make proportionately lesser differences one hundred fathoms about ten inches twenty fathoms about two inches and so on

The best instrument for observing such variations is a glass tube stopped at the top recurved at the bottom three or four feet long to which a strip of paper has been pasted divided into inches and lines for if we fill it with quicksilver we shall see that part of the quicksilver will fall and part of it will remain sus pended and we shall be able to notice exactly the point at which it will be suspended and it will be easy to observe the variations which will take place there because of the varying humidity following upon changes in the weather and those which will take place through the tube s being carried to a higher al titude for leaving it in the same place we shall see that as the weather changes the quicksilver will rise and fall and we shall see that it will vary from one time to another by one inch six lines which correspond exactly to one foot eight inches of water which I gave in another chapter for the difference caused by changes in weather

And carrying the tube from the foot of a mountain to the summit we shall see that when we have gone up ten fathoms the quicksilver will have fallen close

to a line, when we have gone up twenty fathoms it will have fallen two lines, when we have gone up a hundred fathoms it will have fallen nine lines And as we go down, the quicksilver will rise again by the same amounts

All this was tested on the Puy de Dôme in Auvergne, as can be seen in the account of that experiment, and these measurements of quicksilver correspond exactly to those we have just given of water

The same thing is to be understood with respect to the difficulty in opening a bellows, and of the rest

Wherein we see that exactly the same thing happens in the effects produced by the weight of the air as in those produced by the weight of water, for we saw that a bellows immersed in water and hard to open because of the weight of the water, is the less so the nearer we bring it to the surface, and that the quicksilver in a tube immersed in water remains suspended at a greater or lesser height according as it is more or less deep in the water, and all these effects, whether of the weight of the air or of that of water, are such necessary consequences of the equilibrium of fluids that there is nothing clearer in the world

CHAPTER 6 *That as the effects of the weight of the mass of the air increase or diminish according as that weight increases or diminishes, they would cease entirely if we were above the air or in a place where there were none*

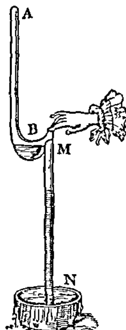
Having now seen that the effects hitherto attributed to the horror of the vacuum but actually due to the weight of the air always depend upon its quantity and that as it increases, they increase and as it diminishes, they diminish, and that for this reason we see in the tube filled with quicksilver the quicksilver remains suspended at a height so much the lower as the tube is carried to a higher altitude, because less air is left above it, just as the quicksilver in a tube immersed in water falls as the tube is lifted toward the surface of the water, because less water is left to counterbalance it, we may conclude with assurance that if we carried the tube to the top of the extreme limit of the air and lifted it entirely out of the air s sphere, the quicksilver would fall entirely since there would no longer be any air to counterbalance it, just as the quicksilver in the tube immersed in water falls entirely when we draw the tube entirely out of the water

The same thing would happen if we could remove all the air from the room in which the experiment was made, for if there were no longer any air weighing upon the recurved end of the tube, we must believe that the quicksilver would fall, no longer having a counterpoise

But because both of these experiments are impossible, since we cannot go above the air and since we could not live in a room entirely emptied of air it is sufficient to remove the air, not from the entire room, but only from about the tube s recurved end to keep the air away from it in order to see if all the quicksilver will fall when there is no longer any air to counterbalance it, and this can easily be done as follows

We must have a tube recurved at the bottom, closed at the end *A* and open at the end *B*, and another tube, straight throughout open at both ends *M* and *N*, but with the end *M* inserted and soldered into the recurved end of the other tube, as in the figure

We must stop *B*, which is the opening of the recurved end of the first tube with the finger or otherwise, as with a pig s bladder, and invert the whole tube



(that is to say the two tubes which actually make only one since they open into each other) fill it with quick silver and then put the end *A* at the top again and the end *N* in a basin of quicksilver what will happen is that the quicksilver of the upper tube will fall in its entirety and all of it will be caught in the curved end unless a part of it flows into the lower tube by the open ing at *M* but only part of the quicksilver in the lower tube will fall and part of it will remain suspended at a height of from twenty six to twenty seven inches according to the place and time of the experiment Now the reason for this difference is that the air weighs upon the quicksilver in the basin at the bottom of the lower tube and accordingly it holds the quicksilver inside suspended and in equilibrium but it does not weigh on the quicksilver at the recurved end of the upper tube (for the finger or the pig s bladder closing it keeps the air out) so that as there is no air weighing on this part the quicksilver in the tube is free to fall since nothing holds it up and opposes its falling

But since nothing is lost in nature if the quicksilver in the curved end does not feel the weight of the air because the finger stopping the opening keeps it away the finger itself by com pensation suffers much pain for it endures all the weight of the air pressing down from above and nothing holds it up from below therefore it feels itself pressed against the glass and as it were drawn and sucked inside the tube and a swelling forms as if under a cupping glass because the weight of the air press ing our finger our hand and our whole body everywhere except at the end of the finger (where it has no access) that part swells and feels pain for the reason just given

And if we remove our finger from the opening the quicksilver in the recurved end will suddenly rise in the tube to a height of from twenty six to twenty seven inches because the air suddenly falling on the quicksilver will immediately lift it to the height capable of counterbalancing it and even because of the violence of its fall it lifts the quicksilver a little beyond the limit but the quicksilver will afterwards fall a little lower and then it will rise again and after some goings and comings as of a weight suspended at the end of a string it will come to rest at a certain height at which it exactly counterbalances the air

Whence we see that when the air does not weigh on the quicksilver at the recurved end all the quicksilver in the tube falls and that consequently if we had taken the tube to a place where there was no air or if possible beyond the air s sphere all the quicksilver would fall

Conclusion of the last three ch ipters

Whence it may be concluded that as the weight of the air is great small or null so the height to which water rises in the pump is great small or null and that the height is always exactly in proportion to the weight as effect to cause.

The same thing must be understood with respect to the difficulty of opening a sealed bellows and so on

CHAPTER 7 *How far water rises in pumps everywhere on the earth*

From everything we know it follows that there are as many different measures of the height to which water rises in pumps as there are different conditions of place and weather for taking the measurement, and that thus if we are asked to what height suction pumps lift water in general, we could not give an exact answer to the question, or even to this other to what height pumps lift water at Paris, unless the state of the air is also specified, since they lift water higher when the air is more laden with moisture, but it is quite possible to say to what height pumps lift water at Paris when the air is most laden, for everything is specified But without stopping at the different heights to which water is lifted in each place according as the air is more or less laden, I shall take the height of the water when the air carries its mean burden of moisture as the natural height of that place, because it is midway between the two extremes and by knowing that measurement we shall know the other two, because we have only to add or subtract ten inches Accordingly I shall give the height to which water rises everywhere in the world, whatever the altitude, when the air has its average moisture

But first it must be understood that in all pumps at the same altitude water rises to exactly the same height (I always mean in the same state of the atmosphere), for since the air has the same height there and consequently the same weight, the weight produces like effects

And that is why I shall first give the height to which water is raised in places at sea level, because the sea is all exactly at the same level (that is to say, equally distant at all points from the center of the earth), for liquids cannot otherwise come to rest since the higher parts would flow down, and so the height to which we find water rises in pumps at any place whatever on the coast will be common to all places in the world on the coast, and it will be easy to infer from that the height to which water will rise in places higher or lower by ten twenty, one hundred, two hundred, or five hundred fathoms, since we have given the differences caused by such differences in altitude

At sea level suction pumps lift water to the height of approximately thirty one feet, two inches (that is, when the air has its average moisture)

This is the measure common to all places in the world at sea level, whence it follows that a siphon lifts water in those places as long as its shorter leg is less than thirty one feet, two inches and that a sealed bellows is opened by the weight of water having that height and the width of its wings which is in conformity with the general rule It is easy to know from this to what height water is raised by pumps in places ten fathoms higher, for since I have said that ten fathoms of altitude cause a decrease of one inch in the height to which water rises, it follows that at those places the water rises only to thirty one feet one inch

And in the same way we find that in places twenty fathoms above sea level water rises to only thirty one feet

In those one hundred fathoms above sea level water rises to only thirty feet four inches

In those with an altitude of two hundred fathoms water rises to twenty nine feet, six inches

In those with an altitude of about five hundred fathoms water rises to almost twenty seven feet

Similarly we could make observations for the rest And for places lower than sea level we shall find in the same way the heights to which the water rises by adding instead of subtracting the differences caused by these differences in altitude

Consequences

1 From all this it is easy to see that a pump never lifts water at Paris to thirty two feet and never lifts it to less than twenty nine and a half feet

2 We also see that a siphon whose short leg is thirty two feet long never works at Paris

3 That a siphon whose short leg is twenty nine feet long or less always works at Paris

4 That at Paris a siphon whose short leg is exactly thirty one feet long sometimes works and sometimes does not work depending on the humidity of the air

5 That a siphon with a short leg twenty nine feet long always works at Paris and never works in a higher place such as Clermont in Auvergne

6 That a siphon ten feet high works everywhere in the world for there is no mountain high enough to keep it from working and that a siphon fifty feet long works nowhere in the world for there is no cave deep enough to make a sufficient depth of air to raise water thus high

7 That water rises in the pumps at Dieppe when the air has its average moisture to thirty one feet two inches as I have said and when the air is most laden to thirty two feet that it rises in pumps on mountains five hundred fathoms above the sea when the air has its mean burden of moisture to twenty six feet eleven inches and when it is least laden to twenty six feet one inch so that there is a difference between this height and that occurring at Dieppe when the air is most laden of five feet eleven inches which is almost one fourth of the height occurring on mountains

8 Just as we see that in all places at the same level water rises to the same height and that it rises less in those of greater elevation so conversely if we see that water rises to the same height in two different places we can conclude they have the same altitude and if it does not rise to the same height we can judge by the difference how much higher one place is than the other which is a way of finding the altitudes of places however far apart quite exactly and very easily since instead of using a suction pump which would be hard to make thus long we need only take a tube three or four feet in length filled with quicksilver and stopped at the top such as we have often spoken of and see at what height the quicksilver remains suspended for its height corresponds perfectly to the height to which water rises in pumps

9 We also see from this that the degrees of heat are not accurately marked in the best thermometers since all the different heights at which the water remains suspended have always been attributed to the rarefaction or condensation of the air inside the tube but we learn from these experiments that changes in the outside air that is in the mass of the air have a great deal to do with them

I pass over a large number of other consequences which follow from this new knowledge as for example the means it gives us of finding out the exact extent of the air s sphere and of the vapors called the atmosphere since by taking exact observations for every hundred fathoms and noting the differences caused by the

first hundred, by the second hundred, and by all the remaining hundreds we would be able to determine accurately the entire height of the air But I leave all that to devote myself to what is essential to the subject

CHAPTER 8 *How much each place in the world is pressed by the weight of the mass of the air*

We learn from these experiments that since the weight of the air and the weight of the water in pumps are in equilibrium, they weigh exactly the same, and that by thus knowing the height to which water rises everywhere in the world we know at the same time how much each place is pressed by the weight of the air above it, and consequently

That places beside the sea are pressed by the weight of the air above them, up to the top of its sphere, exactly as much as if instead of this air there were substituted a column of water thirty-one feet, two inches in height

Places with an altitude of ten fathoms as much as if they carried thirty one feet, one inch of water

Places with an altitude of five hundred fathoms as much as if they carried twenty six feet, eleven inches of water, and similarly of the rest

CHAPTER 9 *How much the entire mass of all the air in the world weighs*

We learn from these experiments that the air at sea level has the same weight as water at a height of thirty one feet, two inches, but because the air weighs less on places above sea level and therefore does not weigh the same on all places on the earth, and even weighs everywhere differently, we cannot calculate a fixed measure which will show how much all places in the world, reduced to an average altitude, are pressed by the air, but we can arrive at a measure by conjecture approaching very closely to the true measure, as for example we may assume that all places on the earth in general, reduced to an average altitude and considered as equally pressed by the air, are as much pressed as if they carried thirty one feet of water, and it is certain that the error in this assumption is not half a foot of water

Now we have seen that the air over mountains five hundred fathoms high weighs as much as water at the height of twenty six feet, eleven inches

And consequently all the air from sea level to the mountain tops five hundred fathoms high weighs as much as water at the height of four feet, one inch, and since that is about one seventh of the entire height it is obvious that the air lying between the sea and these mountains is about one seventh of the entire mass of the air

We learn from these same experiments that the heavy vapors in the air, when it is most charged with them, weigh as much as water at a height of one foot eight inches since to counterbalance themselves, they raise the water in the pumps to this height above the height at which the water already counterbalanced the weight of the air, so that if all the vapors above a region were reduced to water as happens when they are converted to rain, they could produce only one foot, eight inches of water over that region *And if storms sometimes occur in which* the rainfall comes to a greater height it is because the wind carries vapor there from neighboring regions

We also see from this that if the whole sphere of the air were pressed and compressed against the earth by a force which pushing it from above, reduced

it to the smallest possible compass below and reduced it to water it would then have a height of only thirty one feet

And consequently that we must consider the whole mass of the air in its present free state as if it had formerly been like a mass of water thirty one feet deep about the entire earth which should have been extremely rarefied and dilated and converted into this state we call air in which it occupies more space to be sure but keeps exactly the same weight as thirty one feet of water

And as there would be nothing easier than to calculate how many pounds all the water surrounding the earth to a height of thirty one feet would weigh and as a child who knows addition and subtraction could do it we should find by the same calculation how many pounds all the air there is weighs since it is the same thing and if we work it out we shall find the weight of the mass of the air is approximately eight millions of millions of millions of pounds

I wanted to give myself this pleasure and this is how I did the reckoning

I supposed that the diameter of a circle is to its circumference as 7 is to 22

I supposed that when the diameter of a sphere is multiplied by the circumference of its great circle the product is the area of the spherical surface

We know that the circumference of the earth has been divided into 360 degrees This division was arbitrary for it could have been divided into more or less than 360 if desired as could also the celestial circles

It has been found that each of the degrees contains 50 000 fathoms

Leagues in the neighborhood of Paris are 2 500 fathoms and consequently there are 20 leagues to a degree some count 25 but they also give only 2 000 fathoms to the league which comes to the same thing

Each fathom has 6 feet

A cubic foot of water weighs 72 pounds

Whereupon it is very easy to make the desired calculation

For since the great circle or circumference of the earth is 360 degrees

The distance around it is therefore 7 200 leagues

And by the ratio of the circumference to the diameter its diameter will be 2 291 leagues

Therefore multiplying the diameter of the earth by the circumference of its great circle we shall find that its spherical surface has 16 495 200 square leagues

That is to say 103 095 000 000 000 square fathoms

That is to say 3 711 420 000 000 000 square feet

And since a cubic foot of water weighs 72 pounds

It follows that a prism of water with a base of 1 square foot and 31 feet high weighs 2 232 pounds

Therefore if the earth were covered with water to a height of thirty one feet there would be as many prisms of water thirty one feet high as there are square feet in its surface (I know full well they would not be prisms but sectors of a sphere and I purposely neglect to be precise)

And consequently the earth would carry as many units of water each weighing 2 232 pounds as it has square feet in its surface

Therefore all this mass of water would weigh 8 283 889 440 000 000 000 pounds

Therefore the mass of all the air there is has this same weight of 8 238 887 440 000 000 000 pounds

That is to say eight million million million two hundred eighty three thou

sand eight hundred eighty nine million million, four hundred forty thousand million pounds

Conclusion of the two preceding treatises

I have recorded in general in the preceding treatises all the effects which it has hitherto been believed nature produces to avoid a vacuum, wherein I have shown it is absolutely false that they occur for this imaginary reason And I have demonstrated on the contrary by arguments and experiments absolutely convincing that the weight of the mass of the air is their true and only cause So that it is now certain there is no effect in the whole of nature produced by her to avoid a vacuum

After that it will not be difficult to show that nature does not abhor a vacuum, for this way of speaking is improper, since created nature, which is here in question, being inanimate is not capable of passion, accordingly such speech is metaphorical, and nothing more is meant by it than that nature makes the same efforts to avoid the vacuum that she would make if she abhorred it, so that in the opinion of those who speak in this fashion it is the same thing to say that nature abhors a vacuum and to say that nature makes great efforts to prevent a vacuum Therefore, since I have shown she does nothing to avoid the vacuum, it follows that she does not abhor it, for to go on with the same figure, as we say of a man that he is indifferent to a thing if we never observe in any of his actions a movement of desire or aversion for this thing, so we must say of nature that she is perfectly indifferent to the vacuum since we never see her doing anything either to seek it or to avoid it (I always mean by the word *vacuum* a space empty of all bodies perceptible to sense)

It is perfectly true (and this is what led the ancients astray) that water rises in a pump when there is no opening for the air to get in and there would therefore be a vacuum if the water did not follow the plunger, and also that water no longer rises as soon as there are cracks through which the air can enter to fill the pump, whence it seems the water rises only to prevent a vacuum since it rises only when there would be a vacuum

It is certain likewise that a bellows is hard to open when its apertures are so carefully stopped that the air cannot get in and that therefore if it were opened, there would be a vacuum, whereas this resistance ceases when the air can enter to fill the bellows, so that resistance is met only when there would be a vacuum, whence it seems that resistance occurs only from fear of a vacuum

Finally it is certain that all bodies in general make great efforts to follow each other and to keep united whenever there would be a vacuum between them if they were separated, and never otherwise and that is why the conclusion has been drawn that their adhesion comes from the fear of the vacuum

But to show the weakness of this inference I shall make use of the following example when a bellows is in the water in the way I have often described so that the tip of the tube, which I suppose to be twenty feet long is out of the water and exposed to the air and the apertures which are in one of the wings are carefully stopped to keep the water out we know that the bellows is opened with difficulty, and with the greater difficulty the more water there is above it and that if we remove the stoppers from the airholes and the water is free to come in, the resistance ceases

If we wanted to argue in the same way about this effect as about the others we should say when the apertures are stopped and therefore if the bellows were opened air would come in by the tube it is opened with difficulty and when the water can get in to fill the bellows instead of air the resistance ceases Therefore since the bellows resists when air would enter and not otherwise the resistance comes from its horror of the air

Everybody would laugh at this inference because there can be another cause for the bellows resistance And indeed it is obvious that we could not open it without raising the water since the water we would displace in opening it could not enter the body of the bellows and therefore it would have to find room for itself elsewhere and would have to raise the whole mass and that is what causes the resistance which does not occur when the bellows has apertures through which the water may enter for then whether we open or close the bellows the water neither rises nor falls because the water displaced enters the bellows as fast as it is displaced accordingly the bellows is opened without resistance

That is perfectly clear and consequently we must consider that the bellows cannot be opened without two things happening one that air certainly does enter the other that the mass of the water is lifted and it is the latter which causes the resistance and the former is quite unrelated to it although it takes place at the same time

Let us speak in the same way about the difficulty experienced in opening in the air a bellows with all its apertures stopped if it were forcibly opened two things would happen one that there certainly would be a vacuum the other that it would be necessary to lift and hold up the whole mass of the air and it is the latter which causes the resistance encountered and the former has nothing to do with it accordingly the resistance increases and diminishes in proportion to the weight of the air as I have shown

The same thing must be understood of the resistance encountered in separating *all bodies between which there would be a vacuum for the air cannot get in* otherwise there would not be a vacuum And so we could not separate them without lifting and holding up the entire mass of the air and that is what causes the resistance

There you have the true cause of the adhesion of bodies between which there would be a vacuum which we have remained so long without knowing because we have remained so long in false opinions from which we have only gradually emerged so that there have been three different periods in which different views have been held

There were three errors in the world which absolutely prevented our knowing the true cause of the adhesion of bodies

The first error is that almost from the beginning the air was believed to have levity because the ancient authors said so and because those whose profession it is to believe them followed them blindly and would have remained eternally of that opinion if abler persons had not freed them from it by the force of experiment so that it was not possible to think the weight of the air was the cause of the adhesion of bodies when the air was thought not to have any weight

The second error is that it was imagined that the elements do not weigh when *in themselves for no other reason than that we do not feel the weight of water* when we are in it and that a bucket of water is easy to lift as long as it is still there

and only begins to make its weight felt when it leaves the water, as if these effects could come from no other cause or rather as if this cause were not out of the question, there being no reason to believe that the water we draw in a bucket has weight when it is taken out of the water and no longer has any when it is poured back in, that it loses its weight when confounded with the rest and regains it when it quits the level of the water Strange ways that men seek to conceal their ignorance! Because they could not understand why we do not feel the weight of the water and were unwilling to admit it, they said it has no weight in water, to satisfy their vanity by the overthrow of truth, and in this way it became an accepted opinion, and that is why as long as men clung to this fancy it was impossible to believe that the weight of the air was the cause of these effects, since even if they had known that the air is heavy, they would still have said that it does not weigh when in itself, and therefore they would not have believed that it produced any effect by its weight

This is why I showed in the *Equilibrium of liquids* that water weighs when in itself as much as when outside, and I explained there why in spite of that weight a bucket is easy to lift in water and why we do not feel its weight, and in the *Treatise on the weight of the mass of the air* I showed the same thing with respect to the air in order to clear up all doubts

The third error is of a different sort, it is not with respect to the air, but has to do with the effects they attributed to the horror of the vacuum, about which they had completely false ideas

For they imagined that a pump lifts water not only to ten or twenty feet, which is perfectly true, but even to fifty, a hundred, a thousand, and to any height desired, without limit

They also believed that it is not only hard to separate two polished bodies placed together, but absolutely impossible, that an angel could not do it, nor any created force, with a hundred exaggerations too idle to mention, and similarly of the rest

This is an error of fact so ancient that we do not know its origin even Heron, one of the first and most excellent authors to write on the raising of water, expressly states, as a thing that may not be doubted, that the water of a river can be carried over a mountain to be poured into the valley on the other side, provided it be a little lower, by means of a siphon placed on the summit with its legs extending down the sides, one in the river, the other in the next valley, and he asserts that the water will rise from the river to the mountain to redescend into the other valley, whatever the height of the mountain

All those who have written of these matters have said the same thing and even all our fountain builders still claim today that they can make suction pumps which will raise water sixty feet, if desired

Not that either Heron or these authors or these artisans and still less the philosophers, carried their experiments very far, for if they had tried to raise water only forty feet, they would have found it impossible but they had seen suction pumps and siphons six feet ten feet twelve feet long which did not fail to work, and they had never seen the water fail to rise in all the experiments they had happened to make So that they did not imagine there was a certain point beyond which it would be otherwise They thought they were dealing with a necessity of nature whose order could not be changed and since they believed the water rose

because of an invincible horror of the vacuum they were sure it would continue to rise as it had begun without ever ceasing and in this way inferring from what they did see to what they did not see they gave out both as equally true

And it was believed with such certainty that the philosophers have made of it one of the chief principles of their science and the foundation of their treatises on the vacuum It is laid down every day in the classroom and everywhere in the world and as far back as our written records go all men have held to this opinion without anyone s ever having opposed it until now

Perhaps this example will open the eyes of those who dare not think an opinion doubtful if it has from all time been universally accepted by all men since simple artisans have been capable of convicting of error all the great men called philosophers For Galileo declares in his *Dialogues*[1] that he learned from the Italian fountain makers that pumps lift water only to a certain height after which he tested it himself and others afterwards made the experiment in Italy and since then in France with quicksilver more conveniently but only showing the same thing in several different ways

Before this was known it could not be demonstrated that the weight of the air was what raised water in pumps for that weight since it is limited could not produce an infinite effect

But all these experiments did not suffice to show that the air produces these effects because although they freed us from one error they left us in another For certainly it was learned from all these experiments that water rises only to a certain height but it was not learned that water rose higher in places of lower altitude It was thought on the contrary that it always rose to the same height that is was everywhere invariable and since the weight of the air never occurred to anyone it was imagined that the nature of the pump is such that it lifts water to a certain limited height and no further Accordingly Galileo considered it as the pump s natural height and called it *la altezza limitatissima* [the fixed elevation]

How then could it have been imagined that this height was variable according to the variety of places? Certainly that was not likely and yet this last error made it still impossible to prove that the weight of the air is the cause of these effects for since that weight is greater at the foot of a mountain than at the top it is manifest that the effects will be proportionately greater there

That is why I came to the conclusion that we could arrive at the proof only by making the experiment in two places differing from each other in altitude by four or five hundred fathoms And I selected for this purpose the Puy de Dôme in Auvergne for the reason I gave in a little pamphlet I had printed as early as the year 1648 as soon as the experiment had been successfully made

This experiment having revealed that water rises in pumps to quite different heights according to the variety of place and weather and that its height is always proportional to the weight of the air perfected our knowledge of these effects it put all doubts to rest it showed their true cause it established that it is not the horror of the vacuum and in short it supplied all the illumination anyone could wish on this subject

Let it be explained now if possible otherwise than by the weight of the air why suction pumps lift water less high by one quarter on the Puy de Dôme in Auvergne than at Dieppe

[1]See Galileo *Two New Sciences* pp 137 8

Why the same siphon lifts water and transfers it at Dieppe and not at Paris

Why two polished bodies placed together are more easily pulled apart on a belfry than in the street

Why a bellows with all its apertures stopped is easier to open on top of a house than in the yard

Why, when the air is more laden with moisture, the piston of a sealed syringe is harder to draw up

Finally why all these effects are always proportional to the weight of the air, as effect to cause

Does nature abhor a vacuum more on mountains than in valleys, more in wet weather than in clear weather? Does she not hate it equally on a belfry, in an attic, and in the yard?

Let all the disciples of Aristotle bring together all the strongest arguments there are in the writings of their master and of his commentators to account for these things by the horror of the vacuum, if they can, if not, let them recognize that experiments are the true masters to follow in physics, that the experiment made on the mountains overturned the universal belief everywhere held that nature abhors a vacuum and opened up this knowledge which can nevermore be forgotten, that nature has no horror of the vacuum, that she does nothing to avoid it, and that the weight of the mass of the air is the true cause of all the effects hitherto attributed to that imaginary cause

ON GEOMETRICAL DEMONSTRATION

(On the Geometrical Mind)

1 We may have three main objects in the study of truth first to find it when we are seeking it second to demonstrate it after we have found it third to distinguish it from error by examining it

I shall not speak of the first I shall deal especially with the second which includes the third For if we know how to prove the truth we shall know at the same time how to distinguish it from error since by examining whether the proof we give conforms to the rules we know we shall find out whether the truth has been exactly demonstrated

Geometry which excels in all three of these ways has expounded the art of finding unknown truths This art which is called analysis would be useless to discuss after all the excellent books that have been written about it

The art of demonstrating truths already found and of making them so clear that their proofs cannot be refuted is the only art I wish to give To that end I have only to expound the method used by geometry which geometry itself teaches perfectly by example without ever putting it into words And because this art consists of two main parts the proving of each proposition individually and the arranging of all the propositions in the best order my treatise will have two sections of which one will contain the rules of geometrical demonstrations that is scientific and perfect demonstrations and the other will contain the rules of geometrical order that is scientific and complete order so that the two sections taken together will include everything necessary for guiding the reason in proving truths and in distinguishing them from errors My intention is to give these rules in their entirety

SECTION 1 *Concerning the method of geometrical demonstrations that is scientific and perfect demonstrations*

I can give no clearer idea of the procedure we should follow to make our demonstrations convincing than by expounding the method observed in geometry

But first I must give the idea of a method still more eminent and complete but a method to which man could never attain For what goes beyond geometry goes beyond man Nevertheless I must say something about it although it is impossible to put it into practice

This true method which would produce demonstrations of supreme excellence if it were possible to attain to it would consist of two main rules to use no term of which we had not already clearly explained the meaning and never to put forward any proposition unless demonstrated by truths already known that is in a word to define all the terms and to prove all the propositions But to follow the very order I am expounding I must state what I understand by definition

Geometry recognizes only those definitions which logicians call nominal im

positions of a name, that is, on things clearly designated by terms perfectly well known. I speak of such definitions only.

Their usefulness and function is to clarify discourse and to make it more concise by expressing by the name we impose what would otherwise require several terms, in such a way however that the name imposed remains deprived of every other meaning, if it has any, keeping only that one to which it has been uniquely assigned. For example, if we need to distinguish among the numbers those which can be divided into two equal parts from those which cannot, in order to avoid the frequent repetition of this condition we give it a name as follows: I call every number that can be divided into two equal parts an even number.

This is a geometrical definition, because after a thing, in this case every number that can be divided into two equal parts, has been clearly pointed out, it is given a name emptied of all other meaning, if it has any, that it may take the meaning of the thing pointed out.

Whence it is evident that there is great freedom of definition and that definitions are never subject to contradiction, for nothing is more permissible than to give whatever name we please to a thing we have clearly pointed out. Only we must be careful not to take advantage of our freedom to impose names by giving the same name to two different things.

Not that it is inadmissible to do so if we avoid confusion by not extending the consequences of one to the other.

But if we fall into this vice, we can apply to it a most sure and infallible remedy, which is to substitute in the mind the definition in place of the thing defined and always to have such an awareness of the definition that every time we speak, for example, of an even number, we mean precisely a number that can be divided into two equal parts, and that we understand these two things as being so inseparably joined in thought that as soon as one of them occurs in discourse the mind at once attaches the other to it. For geometers and all those who proceed scientifically impose names on things only for concision of discourse and not to impoverish or alter the idea of the subjects of discourse. And they expect the mind always to supplement with the whole definition the short terms, which they use only to avoid the confusion caused by a multitude of words.

Nothing acts more quickly and more effectively against the surprise attacks of captious sophists than this method, which we must always have ready for use, and which alone suffices to banish every kind of difficulty and equivocation.

With these things well understood, I return to my account of the true order, which consists, as I was saying, in defining everything and in proving everything.

Certainly this method would be beautiful, but it is absolutely impossible. For it is evident that the first terms we wished to define would presuppose others for their explication, and that similarly the first propositions we wished to prove would suppose others that preceded them. And thus it is clear we should never arrive at the first propositions.

Accordingly, as we proceed ever further with our investigations, we come of necessity to primitive words which can no longer be defined and to principles so clear that it is no longer possible to find others more clear for their demonstration. Whence it is apparent that men are naturally and inevitably powerless to deal with any science whatsoever in an absolutely perfect order.

But it does not follow that we should abandon every kind of order. For there

is one the order of geometry which is indeed inferior in that it is less convincing but not in that it is less certain It does not define everything and does not prove everything and in this it yields to the perfect order But it assumes only things clear and invariant by the natural light and that is why it is perfectly true nature supporting it in default of discourse This order the most perfect possessed by man does not consist either in defining everything and proving everything or in defining nothing and proving nothing but it consists in holding to the mean of not defining things clear and understood by all men and defining all the rest of not proving all the things known by men and proving all the rest They sin equally against this order who undertake to define everything and prove every thing and who fail to define and prove those things which are not self evident

This is perfectly illustrated by geometry It does not define space time motion number equality or their like which are very numerous because these terms point out so naturally the things they signify to those who understand the lan guage that whatever clarification we might want to give would contribute more obscurity than instruction For nothing is more ineffectual than the discourse of those who try to define these primitive words What need is there for example to explain what we mean by the word *man*? Are we not sufficiently aware of what the thing is we wish to designate by this term? And what help did Plato think he was giving us by saying that man was a two legged animal without feathers? As if the idea of man I naturally have and cannot express were not clearer and more certain than that given me by his useless and even ridiculous explanation since a man by losing his two legs does not lose his humanity and a capon by losing his feathers does not take on humanity

There are even those who go to the absurdity of explaining a word by the word itself I know of some who have defined light in this way Light is a lumi nary motion of luminous bodies as if we could understand the words *luminary* and *luminous* without understanding the word *light* [*lumière*]

We cannot undertake to define being without falling into this absurdity for we cannot define any word without beginning with these words *it is* either ex plicitly or implicitly Therefore to define being we would have to say *it is* and thus use the word defined in the definition

It is sufficiently clear from this that there are words incapable of definition And if nature had not made up for this defect by giving a like idea to all men all our expressions would be confused whereas we make use of them with the same assurance and the same certainty we should have if they had been explained in a perfectly unambiguous way because nature itself has given us without words a clearer understanding of them than we gain through art with all our explanations

Not that all men have the same idea of the essence of those things I say it is impossible and useless to define

For to take an example time is of this kind Who can define it? And why try since all men know what we mean when we speak of time without further desig nation? There are nonetheless many different opinions as to the essence of time Some say that it is the motion of a created thing others the measure of motion etc *Therefore it is not the nature of these things that I say is known by all it is* simply the relation between the name and the thing so that at the expression *time* everyone considers the same object (which is sufficient to make it unnecessary

to define this term) although afterwards, looking into the nature of time we may come to have different opinions when we have set ourselves to thinking about it. For definitions are made only to point out the things named and not to reveal their nature.

Not that we may not call by the name *time* the motion of a created thing, for, as I was just saying, in nothing is there more freedom than in definitions. But as a result of this definition there will be two things called by the name *time*: one is what everybody naturally understands by this word and what all who speak our language name with this term, the other will be the motion of a created thing, for this too will be called by that name in accordance with the new definition. We shall have, therefore, to avoid ambiguity and to keep the consequences separate. For it will not follow that what we naturally understand by the word *time* is in fact the motion of a created thing. We were free to give these two things the same name, but we shall not therefore be free to make them coincide in nature as well as in name.

Thus if the proposition is put forward: 'Time is the motion of a created thing,' we must ask what is meant by the word *time*, whether, that is, it keeps its usual and commonly accepted meaning or whether it has been emptied of that meaning to receive for this occasion, as its meaning, the motion of a created thing. If it has been deprived of all other meaning, the statement cannot be contradicted, and it will be an arbitrary definition with the result, as I have said, that there will be two things having the same name. But if it has been allowed to keep its usual meaning and nevertheless it is maintained that what this word means is the motion of a created thing, the statement can be contradicted. It is no longer an arbitrary definition, it is a proposition requiring proof unless it is evident of itself, in which case it will be a principle and an axiom but never a definition, because in this statement it is not understood that the word *time* signifies the same thing as the words, the *motion of a created thing*, but it is understood that what is meant by the term *time* is this supposed motion.

If I had not known how necessary it is that this should be perfectly understood and how, in familiar speech as in that of science, occasions like the one I have given as an example constantly arise, I should not have lingered over it. But it seems to me, from my experience of the confusion of disputes, that it is impossible to go too thoroughly into that exactness of mind for the sake of which I am writing this whole treatise more than for the subject I deal with in it.

For how many people are there who think they have defined time when they have said that it is the measure of motion, leaving it meanwhile its usual meaning!

And yet they have made a proposition and not a definition. How many are there likewise who think they have defined motion when they have said: '*Motus nec simpliciter actus nec mera potentia est, sed actus entis in potentia.*' And nevertheless if they let the word *motion* keep its usual meaning, as they do, it is not a definition but a proposition; and in this way confounding the definitions they call nominal, which are the true definitions, arbitrary, permissible, and geometrical, with those they call real, which are really propositions by no means arbitrary but subject to contradiction, they take the liberty of making the latter as well as the former; and each defining the same things in his own fashion by a freedom which is as forbidden in this kind of definition as it is permitted in the first, they mix up every

thing and losing all order and all light they lose themselves and wander in a maze of difficulties inexplicable

We shall never get into such trouble if we follow the order of geometry That wise science is very far from defining such primitive words as space time motion equality majority decrease all and those others which the generality of men understand without explanation But with the exception of these the remaining terms used by geometry are so clarified and defined that we have no need of a dictionary to understand any one of them so that in a word all these terms are perfectly intelligible either by the natural light or by the definitions given

This is the way geometry avoids all those vices which may be encountered in connection with the first point which is to define only those things that need to be defined It observes the same conduct with respect to the second point which is to prove those propositions that are not evident For when geometry has reached the first truths that can be known it stops there and requires that they be granted since it has nothing clearer to prove them with so that all the propositions of geometry are perfectly demonstrated either by the natural light or by proofs

Whence it is that if this science does not denne and demonstrate everything it is only because it is impossible for us to do so But since nature supplies every thing not given by the science the order of that science though it does not give a superhuman perfection has all the perfection men are capable of It seemed to me fitting at the very beginning of the treatise to give this

Perhaps it will be thought strange that geometry cannot define any of the things that are its principal objects for it can define neither motion nor numbers nor space and yet these are the three things it particularly considers and in accordance with whose investigation it takes the three different names of mechanics arithmetic geometry this last word belonging both to the genus and to the species

But we shall feel no surprise if we observe that this admirable science concerning itself only with the simplest things the very quality which makes them worthy of being its objects makes them incapable of definition so that the lack of definition is rather a perfection than a defect because it does not come from their obscurity but on the contrary from their extreme evidence which is such that although it is not so convincing as a demonstration it is fully as certain Geometry supposes then that we know what thing is meant by the words *motion number space* and without stopping uselessly to define them it penetrates their nature and lays bare their marvelous properties

These three things which comprise the entire universe in accordance with the words *Deus fecit omnia in pondere in numero et mensura* are reciprocally and necessarily related For we cannot imagine a motion without something which moves and this thing being one that unity is the origin of all number Finally since motion is impossible without space we see that these three things are contained in the first Even time is included there too for motion and time are correlative (fast and slow which differentiate motion having a necessary reference to time)

Thus there are properties common to everything the knowledge of which opens the mind to the greatest marvels of nature

The most important is constituted by the two infinites which are found everywhere the infinitely great and the infinitely small

For however fast a motion may be, we can conceive a faster, and make that still faster, and thus forever to infinity without ever reaching a motion so fast that we can no longer add to it And on the contrary, however slow a motion may be, we can make it slower, and that still slower, and so to infinity without ever reaching such a degree of slowness that we cannot still descend to an infinity of lower degrees without falling into rest

Similarly, however great a number may be, we can conceive a greater, and again a greater than that, and so to infinity without ever reaching one which can no longer be increased And on the contrary, however small a number may be, such as 1/100 or 1/10,000, we can still conceive a smaller, and keep on to infinity without reaching zero or nothing

However great a space may be, we can conceive a greater, and again a still greater, and so to infinity without ever reaching one which can no longer be increased And on the contrary, however small a space may be, we can still consider a smaller, and keep on to infinity without ever reaching an indivisible space which no longer has any extension

It is the same with time We can always conceive a greater without a last, and a lesser without reaching an instant, a pure nothing of duration

Which is saying, in a word, that whatever motion, whatever number, whatever space, whatever time we take, there is always a greater and a lesser, so that they all keep between nothing and infinity, being always infinitely distant from these extremes

None of these truths can be demonstrated, and yet they are the foundations and the principles of geometry But since the cause that makes them incapable of demonstration is not their obscurity but on the contrary their extreme evidence, this lack of proof is not a defect but rather a perfection

Whence we see that geometry can neither define its objects nor prove its principles, but for the sole and favorable reason that both have by nature an extreme clarity, *which is more powerfully convincing* to reason than any discourse

For what is more evident than this truth that any number whatsoever can be increased? Can it not be doubled? That the speed of a motion can be doubled, and that a space likewise can be doubled? And also who can doubt that any number whatsoever can be divided in half, and its half again divided in half? For could that half be nothing? And how could these two halves, which would be two zeros, make a number? In the same way cannot the speed of a motion how ever slow, be cut down by half so that it will traverse the same space in double the time, and how could it be that these two half speeds, which would be two rests, should together make the first speed? Finally cannot a space *however small*, be cut in two, and its halves again cut? And how could it be that these halves should be indivisible without any extension these halves which joined together made the first extension?

Man has no *natural knowledge prior* to this knowledge and surpassing it in clarity Nevertheless, that there may be an example of everything we find minds excellent in every other respect shocked by these infinities and in no way able to accept them

I have never known a man who thought a space could not be increased But I have come across some and very clever too who maintained that a space could be divided into two indivisible parts whatever absurdity might be involved I

tried hard to find the cause of this darkness in them and I discovered there was only one main cause which is that they could not conceive an infinitely divisible content whence they conclude that it is not infinitely divisible

It is a disease natural to man to believe that he possesses the truth directly and this is the reason he is always inclined to deny whatever he cannot understand Whereas in fact he naturally knows nothing but error and should accept as true only those things whose contradictory appears to him to be false Consequently whenever a proposition is inconceivable we must suspend our judgment and not deny it for that reason but examine its contradictory and if we find this manifestly false we may boldly affirm the original statement however incomprehensible it is Let us apply this rule to our subject

There is no geometer who does not believe that space is infinitely divisible One can no more be a geometer without this principle than one can be a man without a soul And yet there is no geometer who understands an infinite division We are sure of that truth only for the reason certainly sufficient that we perfectly grasp the falsity of the statement that by dividing a space we can reach an indivisible part a part that is having no extension

For what is more absurd than to maintain that by continuing to divide a space we finally arrive at a division such that when we divide it in half each of the halves remains indivisible and without any extension at all and that thus these two nothings of extension should together make an extension? For I should like to ask those who have this idea whether they distinctly conceive of two indivisibles as touching If they touch everywhere they are only one self same thing and therefore the two together are indivisible If they do not touch everywhere they touch only in part therefore they have parts therefore they are not indivisible But if they confess as indeed they do when we press them that their proposition is as inconceivable as the other let them recognize that it is not by our capacity to conceive these things that we should judge of their truth since though the two contradictories are both inconceivable it is nevertheless necessarily certain that one of the two is true

But to these imaginary difficulties related only to our weakness let them oppose these natural insights and solid truths if it were true that space is composed of a certain finite number of indivisibles it would follow that of two spaces each a square (that is to say having all its sides equal and similar) but one double the other one would contain a number of these indivisibles double the number of the other Let them keep this consequence well in mind and then let them practise making squares out of points until they have found two of which one has double the points of the other and then I shall make all the geometers in the world give place to them But if this is naturally impossible that is if there is an invincible impossibility in making squares out of points of which one shall have double the points of the other as I would demonstrate in this very place if it were worth the time let them draw the conclusion

And to comfort them in certain difficulties they would find, as in conceiving a space having an infinity of divisibles (in view of its being traversed in so short a time during which time that infinity of divisibles would have been traversed) we must warn them that they must not compare things so disproportionate to each other as are the infinity of divisibles and the short time in which they are traversed but that they should compare the whole of space with the whole of

time, and the infinite divisibles of space with the infinite instants of time, and thus they will find we traverse an infinity of divisibles in an infinity of instants, and a little space in a little time, and in this there is no longer the disproportion that had overwhelmed them

Finally, if it seems strange to them that a small space should have as many parts as a large space, let them also understand that they are proportionately smaller, and let them look at the heavens through a little pane of glass that they may grow familiar with this knowledge by seeing each part of the sky in each part of the glass But if they cannot comprehend that parts so small as to be imperceptible to us can be divided into as many parts as can the heavens, there is no better remedy than to have them look at these delicate points through glasses which magnify each of them into a prodigious mass Whence they will easily conceive that with the aid of another lens still more skilfully cut these points could be magnified to equal that firmament whose extent they wonder at And thus these objects now appearing to them as very easily divisible, let them remember that nature is infinitely more powerful that art For who has told them in fine that these lenses have changed the natural size of the objects or whether they have not on the contrary reëstablished their true size, changed and shrunk by the shape of our eye as by glasses that make smaller?

It is a nuisance to stop for these trifles, but there are times for being childish

It is enough to say to heads that are clear in this matter that two nothings of extension cannot make an extension But because there are some who claim to escape from the light of this truth by the wonderful reply that two nothings of extension can just as well make an extension as two units, neither of which is a number, can when brought together make a number, we must reply to them that they could in the same way object that 20,000 men make an army although no one of them is an army, that 1,000 houses make a city though no one of them is a city, or that the parts make the whole though no one of them is the whole, or, to stay within the comparison of numbers, that two dyads make a tetrad and ten decades a century though a dyad is not a tetrad and a decade is not a century But it is muddleheaded to confuse by comparisons so unequal the unchanging nature of things with their names, which are free, arbitrary, and dependent upon the caprice of those who gave them For it is clear that to facilitate discourse we have given the name of army to 20,000 men that of city to several houses, that of decade to ten units, and that from this freedom arise the names *unit*, *dyad*, *tetrad*, *decade*, *century*, different by the dictates of fancy, although the things referred to are actually of the same kind by their invariable nature and are all related to each other in such a way that they differ only by more and less in spite of the fact that, because of their names a dyad is not a tetrad nor a house a city any more than a city is a house But again although a house is not a city it is not nevertheless a nothing of a city There is a great difference between not being a thing and being a nothing of it

For in order that we may understand the matter thoroughly we must know that the only reason why the unit is not in the class of numbers is that Euclid and the first writers on arithmetic, having several properties to give belonging to all numbers but the unit, in order to avoid repeating that such and such a condition obtains for all numbers but the unit excluded the unit from the meaning of the word *number* in accordance with the freedom we have already mentioned of mak

ing arbitrary definitions Also if they had wanted to they would have excluded the dyad and the triad as well and anything else they pleased (for we are the masters provided we give warning) as on the other hand the unit takes its place if we choose among the numbers and the fractions too And in fact in general propositions we are obliged to consider them there to avoid saying each time In every number and in the unit and in fractions such and such a property is found It is in this indefinite sense I have taken number in all my writings about it But the same Euclid who took away the name of number from the unit which was his privilege to make it clear nevertheless that the unit is not nothing but is on the contrary of the same kind thus defines homogeneous magnitudes Magnitudes he says are said to be of the same kind when one by being multiplied can be made to exceed the other Consequently since the unit can by being multiplied be made to exceed any number whatsoever it is of the same kind as numbers precisely by its essence and unchanging nature according to the same Euclid who would not have it called a number

An indivisible with respect to an extension is a different matter for not only does it differ in name which is arbitrary but it differs in kind by the above definition since an indivisible multiplied as many times as we please is so far from being able to exceed an extension that it can never make anything but a single unique indivisible which is natural and necessary as has already been shown And since this last proof is based on the definition of these two things indivisible and extension we shall go on with the demonstration and complete it

An indivisible is that which is without parts and extension is that which has distinct separate parts

On the basis of these definitions I say that two indivisibles when joined do not make an extension For when they are joined each touches the other in a part and thus the parts by which they are touching are not separate since otherwise they would not be touching However by definition they have no other parts therefore they have no separate parts therefore they are not an extension by the definition which calls for separation of parts The same thing can be shown by the same argument for all the other indivisibles joined to these And therefore an indivisible multiplied as many times as we please will never make an extension. It is not then of the same kind as extension by the definition of the same kind

That is how we demonstrate that indivisibles are not of the same kind as extension Hence it is that two units can indeed make a number since they are of the same kind and that two indivisibles do not make an extension since they are not of the same kind And therefore we see how little reason there is to compare the relation between the unit and numbers to that between indivisibles and extension

But if we wish to find in numbers a comparison that will justly represent what we are considering in extension we must take the relation of zero to the numbers for zero is not of the same kind as numbers because it cannot by being multiplied be made to exceed them so that zero is a true indivisible of number just as the indivisible is a true zero of extension. And we shall find a like relation between rest and motion and between an instant and time for they are all heterogeneous with respect to magnitude because though infinitely multiplied they can never make anything but indivisibles of extension and for the same reason And thus we shall find a perfect correspondence between these things for all these magni

tudes are infinitely divisible without ever being reduced to their indivisibles, so that all of them keep the middle ground between infinity and nothing.

Thus wonderfully has nature related these things, and such are the two marvelous infinites she has set before man, not for his mind's grasp but for its wonder, and to close our consideration of them with a last remark, I shall add that these two infinites, although infinitely different, are nevertheless related to each other in such a way that the knowledge of one necessarily leads to the knowledge of the other.

For in numbers, from the fact that they can always be increased, it follows absolutely that they can always be decreased, and that clearly. For if we can multiply a number up to 100,000 times, say, we can also take a hundred thousandth part of it by dividing it by the same number we multiply it with, and thus every term of increase will become a term of division by changing the integer into a fraction. So that infinite increase includes necessarily infinite division.

In space too we find the same relation between these two opposed infinites. That is to say, from the fact that a space can be infinitely extended, it follows that it can be infinitely diminished, as is apparent from the following example: if we watch through a window a ship moving straight away from us, it is clear that the place in the glass where we see any fixed point we please on the ship will keep rising by a continuous motion as the ship moves away. Therefore if the ship continues its course to infinity, the point will continue to rise, and yet it will never reach the foot of the horizontal line drawn from the eye to the glass, so that it will get closer and closer without ever reaching it, incessantly dividing the space which remains under the horizontal point without ever reaching it. Whence we see that from the infinite extent of the vessel's course there follows as a necessary consequence the infinite and infinitely small division of the little space remaining below the horizontal point.

Those who will not be satisfied with these reasons and continue in the belief that space is not infinitely divisible can never aspire to geometrical demonstrations, and although they may be enlightened in other things, they will have very little light in these, for it is easy to be a very clever man though a bad geometer. But those who clearly see these truths can admire the greatness and the power of nature in that double infinity which surrounds us on every side, and learn by the consideration of such marvels to know themselves, seeing themselves placed between an infinity and a nothing of extension, between an infinity and a nothing of number, between an infinity and a nothing of motion, between an infinity and a nothing of time. Whereupon we can learn to assess ourselves at our just value and to make reflections worth more than all the rest of geometry itself.

I felt obliged to consider at such length this double infinity for the sake of those who, though they do not understand it at first, can be persuaded of it. And although there are many who have light enough to do without this treatise, it may nevertheless be that, necessary to some, it will not be entirely useless to the rest.

SECTION II *Concerning the art of persuasion*

The art of persuasion has a necessary relation to the way in which men agree to what we put before them and to the circumstances of the things we want them to believe.

We all know that opinions are admitted into the soul through two entrances which are its two chief powers understanding and will The more natural entrance is the understanding for we should never agree to anything but demonstrated truths but the more usual entrance although against nature is the will for all men whatsoever are almost always led into belief not because a thing is proved but because it is pleasing This way is low unworthy and foreign to our nature Therefore everybody disavows it Each of us professes to give his belief and even his love only where he knows it is deserved

I am not speaking here of divine truths which I am far from bringing under the art of persuasion for they are infinitely above nature God alone can put them into the soul and in whatever way He pleases I know He has willed they should enter into the mind from the heart and not into the heart from the mind that He might make humble that proud power of reason which claims the right to be judge over the things chosen by the will and that He might cure the infirmity of that will which is all corruption from its unclean loves Whence it comes about that whereas in speaking of human things we say they must be known before they can be loved (which has passed into a proverb) the saints on the contrary say in speaking of divine things that they must be loved in order to be known and that we enter into truth only through charity out of which they have made one of their most useful maxims

Whereby it is apparent that God established this order above nature and entirely opposed to the order which should be natural to men in natural things Nevertheless they have corrupted this order by dealing with profane things as they ought to deal with sacred things because actually we believe almost nothing unless it pleases us And this is why we are so loath to accept the truths of the Christian religion which is entirely opposed to our pleasures Tell us agreeable things and we will listen to you the Jews said to Moses as if agreeableness should govern belief[1] And it is to punish this disorder by an order conformable to it that God sheds His light into our minds only after having tamed the rebelliousness of the will by a heavenly sweetness which charms and seduces it

I speak then only of truths within our reach and it is of them that I say the mind and the heart are the gates as it were through which they are received into the soul but very few enter through the mind whereas they are brought in in crowds through the rash caprices of the will without the counsel of reason

These powers have each their principles and prime motives of action

Those of the mind are natural and universally known truths such as the whole is greater than the part besides many particular axioms accepted by some and not by others which though false when once admitted are as powerful to gain belief as are the truest

The principles of the will are certain desires natural and common to all men such as the desire to be happy which it is impossible for anyone not to have besides many particular objects which each pursues for the sake of happiness and which although actually pernicious because they are capable of pleasing us are as strong to move the will as if they constituted its true happiness

So much for the powers which induce our consent

But as for the qualities of the things we are to persuade men of they differ widely

Some are drawn as necessary conclusions from common principles and ac

cepted truths Of these it is possible to persuade without fail, for by showing their relation to principles that have been granted it is inevitably necessary that we convince, and it is impossible for them not to be received into the soul from the moment we have been able to join them to those truths already admitted there

There are others which are bound up with the objects of our satisfaction, and these too are received with certainty For as soon as the soul is made to see that a thing can bring her to what she sovereignly loves, it is inevitable that she embrace it with joy

But those which have a double bond, with admitted truths and with the heart s desires, are so certain of their effect that there is nothing more certain in nature As on the other hand whatever is related neither to our beliefs nor to our pleasures is importunate to us, false, and completely foreign

In all these cases there can be no doubt But there are others where the things we wish to persuade of are firmly based on known truths, but at the same time are opposed to the pleasures which touch us most nearly And these are in great danger of illustrating by an experience which is all too common what I said at the beginning that this imperious soul, whose boast was to act only by reason, follows by a rash and shameful choice the desires of a corrupt will, whatever resistance the too enlightened mind may offer

It is then that truth and pleasure hang doubtfully in the balance, and the knowledge of one and the feeling of the other engage in a struggle whose outcome is most uncertain since, to judge of it, we should have to know all that takes place in the innermost part of a man, which the man himself almost never knows

Hence it is apparent that, no matter what we wish to persuade of, we must consider the person concerned, whose mind and heart we must know, what principles he admits, what things he loves, and then observe in the thing in question what relations it has to these admitted principles or to these objects of delight. So that the art of persuasion consists as much in knowing how to please as in knowing how to convince, so much more do men follow caprice than reason

Now of these two, the art of convincing and the art of pleasing, I shall confine myself here to the rules of the first, and to them only in the case where the principles have been granted and are held to unwaveringly, otherwise I do not know whether there would be an art for adjusting the proofs to the inconstancy of our caprices

But the art of pleasing is incomparably more difficult more subtle more useful, and more wonderful, and therefore if I do not deal with it it is because I am not able Indeed I feel myself so unequal to its regulation that I believe it to be a thing impossible

Not that I do not believe there are as certain rules for pleasing as for demonstrating, and that whoever should be able perfectly to know and to practise them would be as certain to succeed in making himself loved by kings and by every kind of person as in demonstrating the elements of geometry to those who have imagination enough to grasp the hypotheses But I consider, and it is perhaps my weakness that leads me to think so that it is impossible to lay hold of the rules At least I am sure that if anyone can I know the persons and that no one else has such clear and abundant light in this matter

The reason for this extreme difficulty comes from the fact that the principles

of pleasure are not firm and stable They are different in all men and they vary to such an extent in each individual that there is no man who differs more from another man than from himself at different times A man has other pleasures than a woman has a rich man and a poor man have different pleasures a prince a warrior a merchant a citizen a peasant the old the young the well the sick all vary in this respect the slightest accidents change them

However there is an art the one I am going to expound showing how truths are related to their principles both of truth and of pleasure provided the principles we have once admitted remain constant and are never denied

But since there are few principles of this kind and since outside of geometry which considers only very simple figures there are almost no truths we always agree upon and still fewer objects of pleasure we do not every hour change our mind about I do not know whether it is possible to give fixed rules for making discourse conform to the inconstancy of our caprices

The art which I call the art of persuading and which is simply the management of perfect scientific proofs consists of three essential parts defining by clear definitions the terms to be used laying down evident principles or axioms to prove the matter in question always mentally substituting in the demonstration in place of the things defined their definitions

The reason for this method is apparent since it would be useless to put forward something capable of proof and to undertake its demonstration if we had not first clearly defined all unintelligible terms and since likewise the demonstration must be preceded by the granting of the evident principles required for the demonstration for if we do not make sure of the foundation we can have no assurance of the building and since finally while demonstrating we must mentally substitute the definition in place of the things defined for otherwise we could be led astray by the different meanings encountered in the terms It is easy to see that if we observe this method we are sure to convince since with all the terms so defined that they are understood and entirely free from ambiguity and with the principles granted if in the demonstration we always substitute in thought the definitions in place of the things defined the invincible force of the conclusions cannot fail of its full effect

Accordingly no demonstration satisfying these conditions can ever have met with a shadow of doubt and never can those demonstrations failing to satisfy them have any force

It is very important therefore to understand and to appropriate them and that is why that they may be more easily grasped and more accessible I shall give them all in these few rules which include everything necessary for the perfection of definitions of axioms and of demonstrations and consequently of the entire method of geometrical proofs of the art of persuasion

Rules for definitions 1 Do not attempt to define any of those things so well known in themselves that we have no clearer terms to explain them by

2 Do not leave undefined any terms that are at all obscure or ambiguous

3 Use in the definition of terms only words perfectly well known or already explained

Rules for axioms 1 Do not fail to ask that each of the necessary principles be granted however clear and evident it may be

2 Ask only that perfectly self evident things be granted as axioms

Rules for demonstrations 1 Do not attempt to demonstrate any of those things so self evident that we have nothing clearer to prove them by

2 Prove all propositions that are at all obscure, and use for their proof only axioms that are perfectly evident or propositions already granted or demonstrated

3 Always substitute mentally the definitions in place of the things defined, so you will not be led astray by the equivocation of terms whose meanings have been restricted by the definitions

These are the eight rules which contain the precepts for firm and abiding proofs, three of which are not absolutely necessary and can be neglected without error It is even difficult and impossible, as it were, always to observe them exactly, although for the sake of perfection we should do so to the best of our ability These three are those which come first in each of the divisions

For the definitions Do not define any of the terms that are perfectly well known

For the axioms Do not fail to ask that all the perfectly evident and simple axioms be granted

For the demonstrations Do not demonstrate anything very well known in itself

For it is undoubtedly not a great fault to define and very clearly to explain things which are most clear in themselves, nor to fail to ask in advance that axioms be granted which no one can refuse to grant when the necessity for their use arises, nor finally to prove propositions which would be granted without proof

But the five other rules are absolutely necessary, and we cannot dispense with them without an essential defect and frequently even error That is why I shall repeat them here in detail

Necessary rules for definitions Do not leave undefined any terms at all obscure or ambiguous Use in definitions only terms perfectly well known or already explained

Necessary rule for axioms Ask only that evident things be granted as axioms

Necessary rules for demonstrations Prove all propositions, using for their proof only axioms that are perfectly self evident or propositions already demonstrated or granted Never get caught in the ambiguity of terms by failing to substitute in thought the definitions which restrict or explain them

These five rules comprise everything necessary for making proofs convincing, unchanging, and in a word, geometrical, and the eight together make them still more perfect

I pass now to the order in which propositions should be arranged if they are to have the right geometrical sequence

After having established

These are the rules of the art of persuasion which are contained in these two principles Define all the names imposed, prove everything substituting in thought the definitions in place of the things defined

Whereupon it seems to me in order to anticipate three chief objections that can be made first that this method is not at all new second that it is very easy to learn without there being any necessity of studying the elements of geometry since it consists of these two rules that are known as soon as read and third that it is pretty useless since its use is almost confined to the objects of geometry alone

It must then be shown that there is nothing so little known nothing harder to practise and nothing more useful and more universal

As for the first objection which is that these rules—everything must be defined and everything proved—are common knowledge in the world and that the logicians themselves have included them among the precepts of their art I only wish it were true and so well known that I should not have had the labor of seeking with such care for the source of all the defects of reasoning which are really common But this is so little the case that with the single exception of geometers who are so few in number as to be unique among a whole people and over a long period of time we find no one who knows these rules It will be easy to make this clear to those who have grasped perfectly the little I have said about them but if they have not perfectly understood that I admit they will have nothing to learn in this matter But if these rules have found a way into their minds and have made a strong enough impression to take root and flourish there they will feel how great a difference there is between what is said in this place and such approximations to it as some logicians may have made by chance here and there in their works

Discerning minds know how much difference there is between two similar remarks depending upon the place and accompanying circumstances Will anyone really believe that two persons who have read and learned by heart the same book know it equally well if one understands it in such a way that he knows all its *principles the force of its conclusions the replies to the objections that can be* made and the entire organization of the work whereas in the other the book is dead words and seeds which though the same as those that produced such fertile trees have remained dry and unfruitful in the sterile mind which received them in vain?

Not all those who say the same things possess them in the same way And that is why the incomparable author of the *Art of Conversation*[1] is at such pains to make it clear that we must not judge a man s capacity by the excellence of an observation we have heard him make Instead of carrying over to the speaker our admiration of the speech we should he says penetrate the mind it comes from try and find if he speaks by memory or by a happy chance listen coldly and scornfully to see if he will resent our not having for what he says the esteem it deserves we shall find more often than not that he will disavow it on the spot and that led away from a thought whose worth he does not know he will fall into another thoroughly common and ridiculous We must then fathom how that thought is lodged in its author how whence and to what extent he has made it his own, otherwise the judgment acting in haste will be judged rash

I should like to ask fair minded persons if this principle Matter is naturally and invincibly incapable of thought and this other I think therefore I am are actually the same in the mind of Descartes and in the mind of St Augustine who said the same thing 1200 years before

Certainly I am very far from saying that Descartes is not its true author even if he should have learned it only from the reading of that great saint for I know how much difference there is between making a statement off hand without considering it more fully and at length and seeing in that statement an admirable succession of consequences which proves that matter is distinct from mind and making out of it a firm and consistently held principle of a whole physics as it was the intention of Descartes to do For without examining whether he was

[1]Montaigne *Essays* III 8.

successful in carrying out his intention, I assume that he was, and it is on this assumption that I say the statement in his writings is as different from the same statement in those others who have made it in passing as a man full of life and force is different from a dead man

One man will say a thing off hand without understanding its excellence where another will see a wonderful succession of consequences which make us say boldly that it is no longer the same observation, and that he no more owes it to him from whom he learned it than a splendid tree belongs to some one who scattered the seed, thoughtlessly and without knowing what it was, in a rich soil which derived this profit from the seed by its own fertility

The same thoughts sometimes shoot up in another quite otherwise than in their author, unfertile in their native field, abundant when transplanted But it happens much more often that a good mind itself makes its own thoughts bear all the fruit they are capable of, and that afterwards others, having heard them praised, borrow them and deck themselves out with them, but without knowing their worth, and it is then that the difference of the same observation in different mouths is most apparent

It is in this fashion that logicians may have borrowed the rules of geometry without understanding their force, and thus it does not follow from their happening to include them among the rules proper to logic that they have entered into the spirit of geometry, and unless they give me other indications of it than the passing mention of these rules, I shall be very far from putting them on the level of that science, which teaches the true method for the conduct of reason But on the contrary I shall be very much inclined to exclude them, and almost without hope of return For to have mentioned these rules in passing without noticing that everything is contained in them, and instead of following their light to wander aimlessly in useless investigations, running after what they offer and cannot give, is certainly to show oneself as hardly clearsighted and as having failed to follow the light because one had not seen it

The method of avoiding error is sought by everyone The logicians profess to guide us to it, only the geometers reach it, and outside of their science and its imitators there are no true demonstrations The entire art is contained in these precepts we have given, they alone are sufficient, they alone prove, all other rules are useless or harmful This is what I have learned from a long experience of all kinds of books and men

Wherefore I judge those who say that geometers give them nothing new by these rules because they actually had them but mixed up with a lot of others useless or false, from which they could not separate them out I judge them I say, as I do those who, seeking a diamond of great price among many that are false, which they however could not tell from it should boast holding them all together, that they possess the diamond as truly as he who without stopping at the worthless mass puts his hand on the choice stone they are seeking and for which they did not throw away all the rest

The defect of false reasoning is a malady which is cured by these two remedies Another has been compounded of many useless herbs among which the good are mingled but remain without effect because of the bad qualities of the mixture

To uncover all the sophisms and equivocations of captious arguments they have invented barbarous names which astonish those who hear them and whereas

all the windings of this tangled knot can be straightened out only by pulling one of the ends designated by the geometers they have noted a monstrous number of others in which these are included without their knowing which are the right ones

And thus those who point out to us a number of different roads which they say will take us where we want to go although only two of them lead there must be able to give them a particular mark It will be said that geometry which indicates the roads with certainty only gives what had already been given by the others because they actually gave the same thing and more without its being seen that this present lost its value by its very abundance and that by adding they took away

Nothing is more common than good things the only question is how to discern them it is certain that all of them are natural and within our reach and even known by every one But we do not know how to distinguish them This is universal It is not in things extraordinary and strange that excellence of any kind is found We reach up for it and we are further away more often than not we must stoop The best books are those whose readers think they could have written them Nature which alone is good is familiar and common throughout

I have no doubt then that these rules because they are the true ones should be simple naive natural as they are It is not *barbara* and *baralipton* which form the reason We must not force the mind to fly too high Strained and painful behavior fills it with foolish presumption by giving it an elevation foreign to it and an empty and ridiculous inflation instead of solid and vigorous nourishment And one of the main reasons which keep those who are beginning these studies out of the true road they ought to follow is the notion they get at the start that the good things are inaccessible because they bear the names great high exalted sublime That spoils everything I should like to call them humble common familiar These names suit them better I hate those inflated words

TREATISE ON THE ARITHMETICAL TRIANGLE

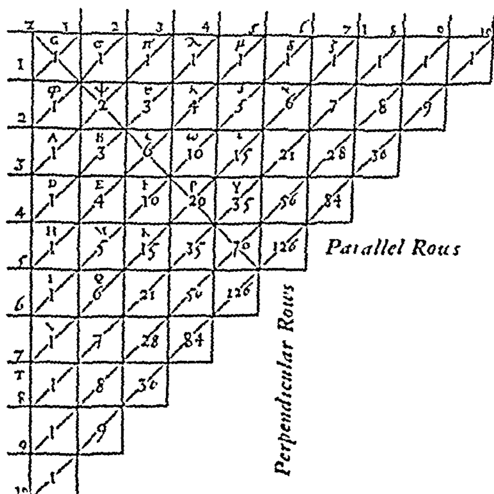
Definitions

I call *arithmetical triangle* a figure constructed as follows

From any point, G, I draw two lines perpendicular to each other GV Gζ in each of which I take as many equal and contiguous parts as I please beginning with G, which I number 1, 2, 3, 4, etc , and these numbers are the *exponents* of the sections of the lines

Next I connect the points of the first section in each of the two lines by another line, which is the *base* of the resulting triangle

In the same way I connect the two points of the second section by another line, making a second triangle of which it is the base



And in this way connecting all the points of section with the same exponent I construct as many triangles and bases as there are exponents

Through each of the points of section and parallel to the sides I draw lines whose intersections make little squares which I call *cells*

Cells between two parallels drawn from left to right are called *cells of the same parallel row*, as for example cells *G*, *σ*, *π*, etc or *φ*, *ψ*, *θ*, etc

Those between two lines drawn from top to bottom are called *cells of the same perpendicular row*, as for example cells *G*, *φ*, *A*, *D*, etc , or *σ*, *ψ*, *B*, etc

Those cut diagonally by the same base are called *cells of the same base* as for example $D\ B\ \theta\ \lambda$ or $A\ \psi\ \pi$

Cells of the same base equidistant from its extremities are called *reciprocals* as for example $E\ R$ and $B\ \theta$ because the parallel exponent of one is the same as the perpendicular exponent of the other as is apparent in the above example where E is in the second perpendicular row and in the fourth parallel row and its reciprocal R is in the second parallel row and in the fourth perpendicular row reciprocally It is very easy to demonstrate that cells with exponents reciprocally the same are in the same base and are equidistant from its extremities

It is also very easy to demonstrate that the perpendicular exponent of any cell when added to its parallel exponent exceeds by unity the exponent of its base

For example cell F is in the third perpendicular row and in the fourth parallel row and in the sixth base and the exponents of rows 3 and 4 added together exceed by unity the exponent of base 6 a property which follows from the fact that the two sides of the triangle have the same number of parts but this is understood rather than demonstrated

Of the same kind is the observation that each base has one more cell than the preceding base and that each has as many cells as its exponent has units thus the second base $\phi\sigma$ has two cells the third $A\psi\pi$ has three etc

Now the numbers assigned to each cell are found by the following method

The number of the first cell which is at the right angle is arbitrary but that number having been assigned all the rest are determined and for this reason it is called the *generator* of the triangle Each of the others is specified by a single rule as follows

The number of each cell is equal to the sum of the numbers of the perpendicular and parallel cells immediately preceding Thus cell F that is the number of cell F equals the sum of cell C and cell E and similarly with the rest

Whence several consequences are drawn The most important follow wherein I consider triangles generated by unity but what is said of them will hold for all others

First Consequence

In every arithmetical triangle all the cells of the first parallel row and of the first perpendicular row are the same as the generating cell

For by definition each cell of the triangle is equal to the sum of the immediately preceding perpendicular and parallel cells But the cells of the first parallel row have no preceding perpendicular cells and those of the first perpendicular row have no preceding parallel cells therefore they are all equal to each other and consequently to the generating number

Thus $\phi = G + 0$ that is $\phi = G$

$A = \phi + 0$ that is ϕ

$\sigma = G + 0$ $\pi = \sigma + 0$

And similarly of the rest

Second Consequence

In every arithmetical triangle each cell is equal to the sum of all the cells of the preceding parallel row from its own perpendicular row to the first inclusive

Let any cell, ω, be taken I say that it is equal to $R+\theta+\psi+\phi$, which are the cells of the next higher parallel row from the perpendicular row of ω to the first perpendicular row

This is evident if we simply consider a cell as the sum of its component cells For ω equals $R+C$

$$\theta+B$$

$$\psi+A$$

$$\phi,$$

for A and ϕ are equal to each other by the preceding consequence

Therefore $\omega=R+\theta+\psi+\phi$

Third Consequence

In every arithmetical triangle each cell is equal to the sum of all the cells of the preceding perpendicular row from its own parallel row to the first, inclusive

Let any cell, C, be taken I say that it is equal to $B+\psi+\sigma$, which are the cells of the preceding perpendicular row from the parallel row of cell C to the first parallel row

This is also apparent, as above, simply by the interpretation of cells

For $C=B+\theta$

$$\psi+\pi$$

$$\sigma,$$

for $\pi=\sigma$ by the first consequence

Therefore $C=B+\psi+\sigma$

Fourth Consequence

In every arithmetical triangle each cell exceeds by unity the sum of all the cells within its parallel and perpendicular rows, exclusive

Let any cell, ξ, be taken I say that $\xi-G=R+\theta+\psi+\phi+\lambda+\pi+\sigma+G$ which are all the numbers between row $\xi\omega CBA$ and row $\xi S\mu$ exclusive

This is also apparent by interpretation

For $\xi=\lambda+R+\omega$

$$\pi+\theta+C$$

$$\sigma+\psi+B$$

$$G+\phi+A$$

$$G$$

Therefore $\xi=\lambda+R+\pi+\theta+\sigma+\psi+G+\phi+G$

N B I have written in the enunciation *each cell exceeds by unity* because the generator is unity If it were some other number, the enunciation should read *each cell exceeds by the generating number*

Fifth Consequence

In every arithmetical triangle each cell is equal to its reciprocal

For in the second base $\phi\sigma$ it is evident that the two reciprocal cells ϕ σ are equal to each other and to G

In the third base A ψ π it is also obvious that the reciprocals π A are equal to each other and to G

In the fourth base it is obvious that the extremes D λ are again equal to each other and to G

And those between B θ are obviously equal since $B = A + \psi$ and $\theta = \pi + \psi$ But $\pi + \psi = A + \psi$ by what has just been shown Therefore etc

Similarly it can be shown for all the other bases that reciprocals are equal because the extremes are always equal to G and the rest can always be considered as the sum of cells in the preceding base which are themselves reciprocals

Sixth Consequence

In every arithmetical triangle the corresponding cells of parallel and perpendicular rows having the same exponents are equal

For they are made up of reciprocal cells

Thus the second perpendicular row $\sigma\psi BEMQ$ is exactly the same as the second parallel row $\phi\psi\theta RSN$

Seventh Consequence

In every arithmetical triangle the sum of the cells of each base is double that of the preceding base

Let any base $DB\theta\lambda$ be taken I say that the sum of its cells is double the sum of the cells of the preceding base $A\psi\pi$

For the extremes	D	λ
are equal to the extremes	A	π
and each of the rest	B	θ
is equal to two cells of the other base	$A+\psi$	$\psi+\pi$

Therefore $D+\lambda+B+\theta = 2A+2\psi+2\pi$

The same thing is demonstrated in the same way of all other bases

Eighth Consequence

In every arithmetical triangle the sum of the cells of each base is a number of the double progression beginning with unity whose exponent is the same as that of the base

For the first base is unity

The second is double the first therefore it is 2

The third is double the second therefore it is 4

And so on to infinity

N B If the generator were not unity but some other number such as 3 the same thing would be true But we should have to take not the numbers of the double progression beginning with unity that is 1 2 4 8 16 etc but those of the double progression beginning with the generator 3 that is 3 6 12 24 48 etc

Ninth Consequence

In every arithmetical triangle each base exceeds by unity the sum of all the preceding bases

For this is a property of the double progression

N B If the generator were other than unity, we should have to say *each base exceeds by the generator*

Tenth Consequence

In every arithmetical triangle the sum of any number of contiguous cells of any base, beginning at an extremity, is equal to the same number of cells of the preceding base together with the same number except one

Let there be taken the sum of any number of cells of base $D\lambda$ for example the first three, $D+B+\theta$

I say it is equal to the sum of the first three of the preceding base, $A+\psi+\pi$, together with the first two of the same base, $A+\psi$

For $\underbrace{D,}$ $\underbrace{B,}$ $\underbrace{\theta,}$

are equal to A, $A+\psi$, $\psi+\pi$,

Therefore $D+B+\theta=2A+2\psi+\pi$

Definition

I call *cells of the bisector* those diagonally cut by the bisector of the right angle, such as cells G, ψ, C, ρ, etc.

Eleventh Consequence

Each cell of the bisector is double the preceding cell in its parallel or perpendicular row

Let any cell of the bisector C, be taken I say it is double θ and also double B

For $C=\theta+B$, and $\theta=B$ by the fifth consequence

N B All the preceding consequences are statements of equalities found in the arithmetical triangle We now proceed to the statements of proportions, of which the following proposition is the foundation

Twelfth Consequence

In every arithmetical triangle, of two contiguous cells in the same base the upper is to the lower as the number of cells from the upper to the top of the base is to the number of cells from the lower to the bottom of the base inclusive

Let any two contiguous cells of the same base I C, be taken I say that

I	C	2	3
the lower	the upper	because there are two cells from I to the bottom namely I, H	because there are three cells from C to the top namely C, F, μ

Although this proposition has an infinity of cases I shall demonstrate it very briefly by supposing two lemmas

The first which is self evident that this proportion is found in the second base for it is perfectly obvious that ϕ σ 1 1

The second that if this proportion is found in any base, it will necessarily be found in the following base

Whence it is apparent that it is necessarily in all the bases For it is in the second base by the first lemma therefore by the second lemma it is in the third base therefore in the fourth and to infinity

It is only necessary therefore to demonstrate the second lemma as follows *If this proportion is found in any base as for example in the fourth* $D\lambda$ that is if D B 1 3 and B θ 2 2 and θ λ 3 1 etc I say the same proportion will be found in the following base $H\mu$ and that for example E C 2 3

For D B 1 3 by hypothesis

Therefore $\underbrace{D+B}_{E}$ B $\underbrace{1+3}_{4}$ 3

Similarly B θ 2 2 by hypothesis

Therefore $\underbrace{B+\theta}_{C}$ B $\underbrace{2+2}_{4}$ 2

But B E 3 4

Therefore by compounding the ratios C E 3 2 QED

The proof is the same for all other bases since it requires only that the proportion be found in the preceding base and that each cell be equal to the cell before it together with the cell above it which is everywhere the case

Thirteenth Consequence

In every arithmetical triangle of two contiguous cells in the same perpendicular row the lower is to the upper as the exponent of the base of the upper is to the exponent of its parallel row

Let any two cells in the same perpendicular row F C be taken I say that

F	C	5	3
the lower	the upper	the exponent of the base of C	the exponent of the parallel row of C

For E C 2 3

Therefore $\underbrace{E+C}_{F}$ C $\underbrace{2+3}_{5}$ 3

Fourteenth Consequence

In every arithmetical triangle of two contiguous cells in the same parallel row the greater is to the lesser as the exponent of the base of the lesser is to the exponent of its perpendicular row

Let two cells in the same parallel row F E be taken I say that

F	E	5	2
The greater	the lesser	the exponent of the base of E	the exponent of the perpendicular row of E

For E C 2 3

Therefore $\underbrace{E+C}_{F}$ E $\underbrace{2+3}_{5}$ 2

FIFTEENTH CONSEQUENCE

In every arithmetical triangle the sum of the cells of any parallel row is to the last cell of the row as the exponent of the triangle is to the exponent of the row

Let any triangle, for example the fourth, $GD\lambda$, be taken I say that whatever row we take, say the second parallel, the sum of its cells, $\phi+\psi+\theta$ θ 4 2 For $\varphi+\psi+\theta=C$, and C θ 4 2, by the thirteenth consequence

SIXTEENTH CONSEQUENCE

In every arithmetical triangle any parallel row is to the next lower row as the exponent of the lower row is to the number of its cells

Let any triangle, for example the fifth, μGH, be taken I say that whatever row we take, say the third, the sum of its cells is to the sum of the cells of the fourth row, that is $A+B+C$ is to $D+E$ as 4, the exponent of the fourth row is to 2, which is the number of its cells, for it has 2

For $A+B+C=F$, and $D+E=M$

But F M 4 2, by the twelfth consequence

N B This proposition could also be enunciated as follows

Each parallel row is to the next lower row as the exponent of the lower row is to the difference between the exponent of the triangle and the exponent of the upper row

For the difference between the exponent of a triangle and the exponent of one of its rows is always equal to the number of cells in the next lower row

SEVENTEENTH CONSEQUENCE

In every arithmetical triangle any cell together with all those of its perpendicular row is to the same cell together with all those of its parallel row as the number of perpendicular cells taken is to the number of parallel cells taken

Let any cell, B be taken I say that $B+\psi+\sigma$ $B+A$ 3 2

I say 3 because three cells are added together in the antecedent and 2 because there are two in the consequent

For $B+\psi+\sigma=C$ by the third consequence and $B+A=F$ by the second consequence

But C F 3 2, by the twelfth consequence

EIGHTEENTH CONSEQUENCE

In every arithmetical triangle two parallel rows equidistant from the extremities are to each other as the number of their cells

Let there be taken any triangle GI[illegible], and two of its rows equidistant from the extremities, such as the sixth $P+Q$ and the second [illegible] I say that the sum of the cells of one is to the sum of the cells of the other as the number of the cells of one is to the number of cells of the other

For by the sixth consequence the second parallel row [illegible] is the same as the second perpendicular row [illegible] of which we have just demonstrated this proportion

N B This proposition can be enunciated as follows

In every arithmetical triangle two parallel rows whose exponents taken together exceed by unity the exponent of the triangle are to each other as their exponents reciprocally

For this is the same thing as what has just been enunciated

Last Consequence

In every arithmetical triangle of two contiguous cells in the bisector the lower is to four times the higher as the exponent of the base of the higher is to a number exceeding it by unity

Let two cells of the bisector ρ C be taken I say that ρ $4C$ 5 (the exponent of the base of C) 6

For $\rho = 2\omega$ and $C = 2\theta$ therefore $4\theta = 2C$

Therefore 4θ C 2 1

But ρ $4C$ ω 4θ or in the ratio compounded of $\underbrace{\omega\ C}$ and $\underbrace{C\ 4\theta}$

by the preceding consequences 5 3 1 2 or 3 6

$$\underbrace{5\ 3 \qquad 3\ 6}_{5\qquad 6}$$

Therefore ρ $4C$ 5 6 Q E D

N B I pass over many other proportions that this triangle could be made to yield because every one can easily discover them for himself and because those who are willing to devote themselves to the task will perhaps find more admirable ones than any I could give I end therefore with the following problem which completes the treatise

Problem

Given the perpendicular and parallel exponents of a cell to find its number without making use of the arithmetical triangle

Let it be proposed for example to find the number of cell ξ of the fifth perpendicular and of the third parallel row

All the numbers which precede the perpendicular exponent 5 having been taken namely 1 2 3 4 let there be taken the same number of natural numbers beginning with the parallel exponent 3 namely 3 4 5 6

Let the first numbers be multiplied together and let the product be 24 Let the second numbers be multiplied together and let the product be 360 which divided by the first product 24 gives as quotient 15 which is the number sought

For ξ is to the first cell of its base V in the ratio compounded of all the ratios of the cells between that is to say ξ V

in the ratio compounded of ξ ρ ρ λ λ Q Q V

or by the twelfth consequence 3 4 4 3 5 2 6 1

Therefore ξ V 3 4 5 6 4 3 2 1

But V is unity therefore ξ is the quotient of the division of the product of 3 4 5 6 by the product of 4 3 2 1

N B If the generator were not unity we should have had to multiply the quotient by the generator

VARIOUS USES OF THE ARITHMETICAL TRIANGLE WHOSE GENERATOR IS UNITY

Having given the proportions obtaining between the cells and the rows of arithmetical triangles I turn in the following treatises to various uses of those triangles whose generator

is unity But I leave out many more than I include, it is extraordinary how fertile in properties this triangle is Everyone can try his hand I only call your attention here to the fact that in everything that follows I am speaking exclusively of arithmetical triangles whose generator is unity

USE OF THE ARITHMETICAL TRIANGLE FOR THE ORDERS OF NUMBERS

The numbers of the different progressions have been considered in arithmetic, those of the different powers and of the different degrees have also been considered, but those of which I am speaking have not, it seems to me been sufficiently investigated, although they are extremely useful They do not even have a name, therefore I have been obliged to give them one Because *progression, degree*, and *power* are already in use, I adopt the name *order*

I call therefore *numbers of the first order* the units,

1, 1, 1, 1, 1, etc

I call *numbers of the second order* the natural numbers which are formed by addition of the units,

1, 2, 3, 4, 5, etc

I call *numbers of the third order*, known as triangular numbers those which are formed by addition of the natural numbers,

1, 3, 6, 10, etc

That is, the second triangular number, 3, is equal to the sum of the first two natural numbers, which are 1, 2, the third triangular number, 6 is equal to the sum of the first three natural numbers 1, 2, 3, etc

I call *numbers of the fourth order*, known as pyramidal numbers, those which are formed by addition of the triangular numbers,

1, 4 10 20, etc

I call *numbers of the fifth order* those which are formed by addition of the preceding numbers Since there is no fixed name for them they might be called triangulo triangular numbers

1, 5 15, 35 etc

I call *numbers of the sixth order* those which are formed by addition of the preceding numbers,

1, 6 21 56 126, 252 etc

And so on to infinity 1, 7, 28 84 etc

1, 8 36, 120 etc

Now if we make a table of all the orders of numbers in which we indicate the exponents of the orders at the side and the roots at the top, as follows

ROOTS

		1	2	3	4	5	etc
Units	Order 1	1	1	1	1	1	etc
Natural numbers	Order 2	1	2	3	4	5	etc
Triangular numbers	Order 3	1	[illegible]	6	10	15	etc
Pyramidal numbers	Order 4	1	4	10	[illegible]	35	etc
	etc						

we shall find this table equivalent to the arithmetical triangle

The first order of numbers will be the same as the first parallel row of the triangle

The second ord r of numbers will be the same as the second parallel row and so on to infinity

For in the arithmetical triangle the first row is wholly made up of units and the first order of numbers is also made up of units

Also in the arithmetical triangle each cell say F is equal to the cell above together with all the preceding cells in that parallel that is $C+B+A$ as was proved in the second consequence of the treatise on this triangle And we find the same thing in each order of numbers For example the third pyramidal number 10 is equal to the first three triangular numbers 1 3 6 since it is formed by their addition

Whence it is plainly seen that the parallel rows of the triangle are nothing but the orders of numbers and that the exponents of the parallel rows are the same as the exponents of the orders and that the exponents of the perpendicular rows are the same as the roots Thus for example the number 21 which in the arithmetical triangle is in the third parallel row and in the sixth perpendicular row when considered with respect to the orders of numbers is of the third order and the sixth of its order or of the sixth root

Which makes it clear that everything we have said of the rows and cells of the arithmetical triangle applies exactly to the orders of numbers and that the same equalities and the same proportions we pointed out in the former will also be found in the latter We need only change the enunciations by substituting the terms which apply to the orders of numbers such as root and order for those which applied to the arithmetical triangle such as parallel and perpendicular rows I shall devote a separate little treatise to the subject a few examples given there will make it easy to see what all the rest would be

USE OF THE ARITHMETICAL TRIANGLE FOR COMBINATIONS

The word *combination* has been used in several different senses so that to avoid ambiguity I am obliged to say how I understand it

When of many things we may choose a certain number all the ways of taking as many as we are allowed out of all those offered to our choice are here called the *different combinations*

For example if of four things expressed by the four letters A B C D we are permitted to take say any two all the different ways of taking two out of the four put before us are called *combinations*

Thus we shall find by experience that there are six different ways of choosing two out of four for we can take A and B or A and C, or A and D or B and C or B and D or C and D

I do not count A and A as one of the ways of taking two for they are not different things they are only one thing repeated

Nor do I count A and B and B and A as two different ways for in both ways we take only the same two things but in a different order and I am not concerned with the order so that I could make myself understood at once by those who are used to considering combinations simply by saying that I speak only of combinations made without changing the order

We shall also find by experience that there are four ways of taking three things out of four for we can take ABC or ABD or ACD or BCD

Finally we shall find that we can take four out of four in one way only $ABCD$

I shall speak therefore in the following terms

1 in 4 can be combined 4 times
2 in 4 can be combined 6 times
3 in 4 can be combined 4 times
4 in 4 can be combined 1 time

Or

the number of combinations of 1 in 4 is 4
the number of combinations of 2 in 4 is 6
the number of combinations of 3 in 4 is 4
the number of combinations of 4 in 4 is 1

But the sum of all the combinations in general that can be made in 4 is 15 because the number of combinations of 1 in 4, of 2 in 4, of 3 in 4 of 4 in 4, when joined together, is 15

After this explanation I shall give the following consequences in the form of lemmas

LEMMA 1

There are no combinations of a number in a smaller number, for example 4 cannot be combined in 2

LEMMA 2

There is 1 combination of 1 in 1
There is 1 combination of 2 in 2
There is 1 combination of 3 in 3
And in general there is only one combination of a number in an equal number

LEMMA 3

There is 1 combination of 1 in 1
There are 2 combinations of 1 in 2
There are 3 combinations of 1 in 3
And in general there are as many combinations of 1 in any number as there are units in the number

LEMMA 4

If there are four numbers, the first of which is arbitrary the second exceeding the first by unity the third any number not smaller than the second the fourth exceeding the third by unity the number of combinations of the first in the third together with the number of combinations of the second in the third is equal to the number of combinations of the second in the fourth

Let there be four numbers as specified

The first, arbitrary for example 1

The second exceeding the first by unity 2

The third not smaller than the second for example 3

The fourth exceeding the third by unity 4

I say that the number of combinations of 1 in 3 together with the number of combinations of 2 in 3 is equal to the number of combinations of 2 in 4

Let there be taken any three letters B, C, D

Let there be taken the same three letters together with another A B C D

Let us take in accordance with the proposition all the combinations of one letter in the three *B C D* There will be 3 namely *B C D*

Let us take in the same three letters all the combinations of two There will be 3 namely *BC BD CD*

Finally let us take in the four letters *A B C D* all the combinations of two There will be 6 namely *AB AC AD BC BD CD*

We must demonstrate that the number of combinations of 1 in 3 and of 2 in 3 is equal to the number of combinations of 2 in 4

The demonstration is easy for the combinations of 2 in 4 are made up of the combinations of 1 in 3 and of 2 in 3

That this may be seen it is necessary to observe that among the combinations of 2 in 4 namely *AB AC AD BC BD CD* some have the letter *A* and some do not

Those not having it are BC BD CD which consequently are made up of two of the three letters *B C D* therefore they are the combinations of 2 in the three letters *B C D* Therefore the combinations of 2 in the three letters *B C D* constitute a part of the combinations of 2 in the four letters *A B C D* since they are made up of those not having *A*

Now if from the combinations of 2 in 4 having *A* namely *AB AC AD* we take away *A* there will remain one letter only of the three *B C D* namely *B C, D* which are precisely the combinations of one letter in the three letters *B C, D* Therefore if to each of the combinations of one letter in the three letters *B C, D* we add the letter *A* thus having *AB AC AD* we shall make the combinations of 2 in 4 having *A* Therefore the combinations of 1 in 3 constitute a part of the combinations of 2 in 4

Whence it is seen that the combinations of 2 in 4 are made up of the combinations of 2 in 3 and of 1 in 3 and therefore that the number of the combinations of 2 in 4 is equal to that of 2 in 3 and of 1 in 3

We can show the same thing in all the other examples as

The number of combinations of 29 in 40
and the number of combinations of 30 in 40
are equal to the number of combinations of 30 in 41

Also the number of combinations of 15 in 55
and the number of combinations of 16 in 55
are equal to the number of combinations of 16 in 56
and so on to infinity Q E D

Proposition 1

In every arithmetical triangle the sum of any parallel row of cells is equal to the number of combinations of the exponent of the row in the exponent of the triangle

Let any triangle for example the fourth *GD*λ be taken I say that the sum of the cells of any row for example the second $\phi+\psi+\theta$ is equal to the number of combinations of 2 the exponent of the second row in 4 the exponent of the triangle

Similarly the sum of the cells of the fifth row of the eighth triangle is equal to the number of combinations of 5 in 8 etc.

Although there is an infinity of cases the demonstration can be briefly given by means of the two following lemmas

The first, which is self evident, that this equality is found in the first triangle since the sum of the cells of its only row, namely G or unity, is equal to the number of combinations of 1, the exponent of the row, in 1, the exponent of the triangle,

The second, that if an arithmetical triangle is found which has this equality, namely, that whatever row we take, the sum of the cells is equal to the number of combinations of the exponent of the row in the exponent of the triangle, I say that the following triangle will have the same property

Whence it follows that all the arithmetical triangles have this equality For the first has it by the first lemma, and it is even still evident in the second, therefore by the second lemma the next triangle will have it too, and consequently the next, and so on to infinity

All that is necessary then is to demonstrate the second lemma

Let any triangle be taken, for example, the third, in which we suppose this equality, namely, that the sum of the cells of the first row, $G+\sigma+\pi$ is equal to the number of combinations of 1 in 3, and that the sum of the cells of the second row, $\phi+\psi$, is equal to the combinations of 2 in 3, and that the sum of the cells of the third row, A, is equal to the combinations of 3 in 3, I say that the fourth triangle will have the same equality and that for example the sum of the cells of the second row, $\phi+\psi+\theta$, is equal to the number of combinations of 2 in 4

For $\phi+\psi+\theta \quad = \quad \underbrace{\phi+\psi} \quad + \quad \underbrace{\theta}_{\underbrace{G+\sigma+\pi}}$

By hypothesis — or the number of combinations of 2 in 3 + or the number of combinations of 1 in 3

By the fourth lemma — or the number of combinations of 2 in 4

The same demonstration applies to all other cases Q E D

PROPOSITION 2

The number of any cell is equal to the number of combinations of a number less by unity than its parallel exponent in a number less by unity than the exponent of its base

Let any cell be taken, say F in the fourth parallel row and in the sixth base I say that it is equal to the number of combinations of 3 in 5 less by unity than 4 and 6, for it is equal to the cells $A+B+C$. Therefore by the preceding proposition etc.

PROBLEM 1, PROPOSITION 3

Two numbers having been set out, to find by the arithmetical triangle how many combinations there are of one in the other

Let the numbers set out be 4, 6. We must find how many combinations there are of 4 in 6

First way Take the sum of the cells of the fourth row in the sixth triangle it will satisfy the problem

Second way Take the fifth cell of the seventh base, because these numbers 5, 7, exceed by unity the given numbers 4, 6, the number of this cell is the required number

Conclusion

It is easy to see from the relation between the cells and the rows of the arith metical triangle and combinations that everything proved of the former applies to the latter analogously as I shall show in few words in a little treatise I have *written on combinations*

USE OF THE ARITHMETICAL TRIANGLE

To determine how the stakes should be divided between two players playing for a set of games

To understand the rules of divisions the first thing to consider is that the money staked by the players on the game no longer belongs to them for they have given up its ownership But they have received in return the right to expect what ever chance may give them in accordance with the conditions agreed upon at the beginning

But since the law by which they are playing is voluntary they can break it at will and therefore at any stage of the game they can stop and reversing their procedure at the beginning give up their expectations from chance and each return to the ownership of something In this event the determination of what is to belong to them should be so related to what they had a right to hope from fortune that each of them thinks it comes to exactly the same thing to take what is assigned to him or to continue to run the risks of the game this just distribu tion is called the division (of the stakes)

The first principle leading to a knowledge of how divisions should be made is as follows

If the position of a player is such that whatever happens a certain sum is to belong to him whether he wins or loses and chance cannot take it from him he should not divide it but take the whole of it as having been assured to him Since the division should vary as the chances and since there is no chance of losing he should withdraw the entire sum without division

The second principle is as follows If the position of two players is such that if one wins a certain sum will belong to him and if he loses it will belong to the other if the game is a game of pure chance and if there are as many chances for one as for the other and consequently no more reason why one should win than the other if they want to separate without playing and take what legitimately belongs to them they should divide equally the sum ventured and each take his half

FIRST COROLLARY

If two players are playing a game of pure chance on condition that if the first player wins a certain sum will be his and if he loses a smaller sum will be his and if they wish to separate without playing and each take what belongs to him the division is that the first player take what would be his if he lost together with half the difference between that and what would be his if he won

For example if two players are playing on condition that if the first wins he will get 8 pistoles and if he loses 2 I say the division is that he take the 2 together with half the difference between 8 and 2 that is 3 for the difference is 6 half of which is 3

For by hypothesis if he wins, he gets 8, that is, 6+2, and if he loses 2 therefore 2 belong to him in either case and consequently by the first principle he should not divide them but take them both But as for the other 6, they depend on fortune, so that if it favors him, they are his, if not, they belong to his opponent and by hypothesis there is no more reason for their going to one than to the other Therefore they should divide them evenly and each take his half which is what I had proposed

Therefore, to say the same thing in other words, he gets his share as loser together with half the difference between his shares as loser and as winner

And consequently if, when he loses, A is his, and when he wins $A+B$ the division is that he get $A+\frac{1}{2}B$

SECOND COROLLARY

If two players are playing in the same condition as stated above I say that the division can be made as follows, which comes to the same thing that the winner's and the loser's shares be put together and that the first player take half of this sum, that is that 2 and 8 be added together to make 10, half of which, 5, will belong to the first player

For half of the sum of two numbers is always the same as the smaller together with half of their difference

Which is demonstrated as follows

Let A be the loser's share and $A+B$ the winner's share I say the division is made by adding these two numbers, which make $A+A+B$ and giving half to the first player, which is $\frac{1}{2}A+\frac{1}{2}A+\frac{1}{2}B$ For this sum is equal to $A+\frac{1}{2}B$ which has been proved to be the just distribution

These foundations having been laid, we shall proceed with ease to determine the division between two players who are playing for a set of any number of games whatever their actual status, that is, what the division should be when they are playing for a set of two games with a score of 1 to 0 or for a set of three games with a score of 1 to 0 or 2 to 0 or 2 to 1 and in general whatever the number of games in the set and whatever the score of the players

The first observation to make is that two players who are playing for a set of two games with a score of 1 to 0 are in the same position as two others who are playing for a set of three games with a score of 2 to 1 For both couples have this in common that in order to win one player needs only one game and the other, two And therein consist the odds, which should determine divisions, so that strictly only the number of games left for each to win should be considered and not the number won since, as we have already said two players playing for a set of two games with a score of 1 to 0 have the same status as two players playing for a set of twelve games with a score of 11 to 10

The question must accordingly be put as follows

Given two players each of whom lacks a certain number of games to complete the set, to make the division

I shall give the method here which I shall carry out only in two or three examples, which will be so easy to go on with that there will be no need of more

For the sake of completeness I shall start with the first example, which it is perhaps inappropriate to mention because it is too clear I do so however to begin with the beginning

FIRST CASE

If one of the players has the required number of games and the other has not the whole sum belongs to the first player for he has won it since he lacks none of the games in which he was to win it

SECOND CASE

If one of the players lacks one game and the other one they should divide the money equally and each take his half as is evident by the second principle It is the same if one lacks two games and the other two and whatever number of games one lacks if the other lacks as many

THIRD CASE

If one player lacks one game and the other two the division is determined as follows

Let us consider what would belong to the first player (who lacks only one game) if he should win the next game and then what would belong to him if he lost

It is obvious that if the player who lacks only one game wins the game to be played he will not lack any therefore the entire sum will belong to him by the first case But on the contrary if the player who lacks two games wins the one to be played he will only lack one therefore each will be in the position of lacking one game Therefore they should divide the money equally by the second case

Therefore if the first wins this game the entire sum will belong to him and if he loses it half will be his therefore if they wish to separate without playing the game ¾ will belong to him by the second corollary

And if we give an example of the sum they are playing for the matter will be much clearer

Let us say 8 pistoles therefore the first player if he wins should have it all that is 8 pistoles and if he loses half that is 4 therefore in case of division half of 8+4 that is 6 pistoles out of 8 belong to him for 8+4=12 half of which is 6

FOURTH CASE

If one of the players lacks one game and the other three the division will be found similarly by investigating what belongs to the first player if he wins and if he loses

If he wins he will have all his games and consequently all the money which is for example 8

If the first player loses the second player who lacked three games will now lack only two Therefore their status will be that the first player lacks one game and the second player two consequently by the preceding case 6 pistoles will belong to the first

Therefore if he wins he should have 8 and if he loses 6 therefore in case of division half of these two sums belongs to him that is 7 for 6+8=14 half of which is 7

FIFTH CASE

If one of the players lacks one game and the other four the method is the same

The first if he wins wins the entire sum which is for example 8 if he loses

he lacks one game to the other's three, therefore 7 pistoles out of 8 belong to him. Therefore in case of division half of 8 plus half of 7 belong to him, that is, 7½.

SIXTH CASE

Similarly if one player lacks one game and the other five, and so on to infinity.

SEVENTH CASE

The same method applies if the first player lacks two games and the second three, for we must always examine the results of winning and of losing.

If the first player wins, he will lack one game to the second player's three, therefore by the fourth case 7 out of 8 will belong to him.

If he loses, both players will lack two games, therefore by the second case half, that is, 4, belongs to each. Therefore the first player will have 7 if he wins and 4 if he loses, therefore in case of division he will get half of the two together, that is, 5½.

In this way we shall determine the divisions for every kind of situation by always taking what belongs to the first player if he wins and what belongs to him if he loses and assigning to him in case of division half of these two sums.

This is one method of determining divisions.

There are two others, one by the arithmetical triangle and the other by combinations.

METHOD FOR DIVIDING THE STAKES BETWEEN TWO PLAYERS WHO ARE PLAYING FOR A SET OF GAMES BY MEANS OF THE ARITHMETICAL TRIANGLE

Before giving the method we must demonstrate the following lemma.

LEMMA

If two players are playing a game of pure chance on condition that if the first player wins, there will belong to him some part of the sum they are playing for, expressed by a fraction, and that if he loses there will belong to him a smaller part of the same sum expressed by another fraction, if they wish to separate without playing the [illegible] will be determined as follows. If the two fractions are not of the same denominator, [illegible] be reduced to a common denominator. Let a fraction be taken whose numerator [illegible] of the two numerators and whose denominator is double the common denominator [illegible] fraction expresses the part of the sum at stake belonging to the first player.

For example, let $\frac{3}{4}$ of the stakes belong to him if he wins and $\frac{1}{4}$ if he loses. I say that what belongs to him in case of division will be found by taking the sum of the numerators, which is 4, and double the denominator, which is [illegible], and out of them making the fraction $\frac{4}{8}$.

For by what was demonstrated in the second corollary we had to add the cases of winning and losing and take half the sum. Now the sum of the two fractions $\frac{3}{4}$ and $\frac{1}{4}$ is $\frac{4}{4}$, which is obtained by adding the numerators, and half the [illegible] $\frac{4}{4}$ and thus we have $\frac{4}{8}$ [illegible] got by doubling the denominator [illegible]

Now these rules are general and without exception [illegible] ning or losing, for if for example [illegible] belongs to a player [illegible] if he loses [illegible] the two fractions to the same denominator [illegible]

$\frac{1}{2}$ if he wins and $\frac{0}{2}$ if he loses therefore in case of division the required fraction is $\frac{1}{4}$ whose numerator is equal to the sum of the other two and whose denominator is double theirs

Similarly if the entire sum belongs to a player if he wins and $\frac{1}{3}$ if he loses reducing the fractions to a common denominator we shall have $\frac{3}{3}$ if he wins and $\frac{1}{3}$ if he loses therefore in case of division $\frac{4}{6}$ belongs to him

Similarly if the entire sum belongs to a player if he wins and nothing if he loses the division will obviously be $\frac{1}{2}$ for winning gives $\frac{1}{1}$ and losing $\frac{0}{1}$ therefore the division is $\frac{1}{2}$

And similarly for all possible cases

PROBLEM I PROPOSITION I

Given two players each of whom lacks a certain number of games to complete the set to find by the arithmetical triangle what the division should be (if they wish to separate without playing) in the light of the games each lacks

Let there be taken in the triangle the base which has as many cells as the two players together lack games then let there be taken in this base as many contiguous cells beginning with the first as the first player lacks games and let the sum of their numbers be taken Therefore there remain as many cells as the second player lacks games Again let the sum of their numbers be taken These sums are to each other as the odds of the players reciprocally so that if the sum at stake is equal to the sum of the numbers of all the cells of the base there will belong to each player that part of it contained in as many cells as the other lacks games And if they are playing for other stakes their shares will be proportional

For example let there be two players one of whom lacks two games and the other four to find the division

Let there be added together the two numbers 2 and 4 and let their sum be 6 Let the sixth base of the arithmetical triangle be taken $P\delta$ in which there are consequently six cells P M Γ ω S δ Let there be taken as many cells beginning with the first P as the first player lacks games that is to say the first two P M Therefore there remain as many cells as the second player lacks games that is four Γ ω S δ

I say that the odds of the first player are to the odds of the second player as $\Gamma+\omega+S+\delta$ is to $P+M$ which is to say that if the sum at stake is equal to $P+M+\Gamma+\omega+S+\delta$ the sum of the four cells $\delta+S+\omega+\Gamma$ belongs to the player who lacks two games the sum of the two cells $P+M$ to the player who lacks four games And if they are playing for other stakes their shares will be proportional

And to speak generally whatever the sum at stake the share of the first player is expressed by the fraction $\frac{\Gamma+\omega+S+\delta}{P+M+\Gamma+\omega+S+\delta}$ of which the numerator is the sum of the second player s four cells and the denominator the sum of all the cells And the share of the second player is expressed by the fraction $\frac{P+M}{P+M+\Gamma+\omega+S+\delta}$ of which the numerator is the sum of the first player s two cells and the denominator again the sum of all the cells

And if one player lacks one game and the other five the share of the first

player is the sum of the first five cells, $P+M+\Gamma+\omega+S$, and the share of the second player is cell δ

And if one player lacks six games, and the other two, the division will be found in the eighth base, in which the first six cells contain the share of the player who lacks two games and the other two the share of the player who lacks six, and so on to infinity

Although this proposition has an infinity of cases, I shall nevertheless demonstrate it in a few words by means of two lemmas

The first lemma is that the second base contains the divisions of the players who lack two games in all

The second lemma is that if any base contains the divisions of those lacking as many games as the base has cells, the next base will do the same, that is, it too will contain the divisions of the players lacking as many games as the base has cells

From which I conclude, in a word, that all the bases of the arithmetical triangle have this property, for the second base has it by the first lemma therefore by the second lemma the third base has it too, and consequently the fourth, and so on to infinity Q E D

We have then only to demonstrate these 2 lemmas

The first is self evident, for if each player lacks one game, it is evident that their positions are to each other as ϕ to σ, that is, as 1 to 1, and that the share of each is expressed by the fraction $\frac{\sigma}{\phi+\sigma}$, which is ½

The second lemma is demonstrated as follows

If any base, such as the fourth, $D\lambda$, contains the divisions of those lacking four games, that is to say that if the first player lacks one and the second three, the share of the stakes belonging to the first is expressed by the fraction $\frac{D+B+\theta}{D+B+\theta+\lambda}$, which has as denominator the sum of the cells of the base and as numerator the first three cells, and that if both players lack two games the fraction belonging to the first is $\frac{D+B}{D+B+\theta+\lambda}$, and that if the first player lacks three games and the second one, the fraction of the first is $\frac{D}{D+B+\theta+\lambda}$ etc

I say that the fifth base also contains the divisions of those lacking five games and that if for example, the first player lacks two games and the second player three, the share of the stakes belonging to the first is expressed by the fraction $\frac{H+\Gamma+C}{H+\Gamma+C+R+\mu}$

For to know what belongs to two players each of whom is lacking [illegible] games we must take the fraction which would belong to the first player if he won and that which would belong to him if he lost and if they are not of the same denomination reduce them to a common denominator then form a fraction of which the numerator is the sum of the two others and the denominator double the other by the preliminary lemma

Let us examine then the fraction which would belong to the first player if he won and if he lost

If the first player who lacks two games wins the one to be played he will

lack only one and the second player will still lack three therefore they will lack four games in all therefore by hypothesis their division is found in the fourth base and the share of the first will be the fraction $\frac{D+B+\theta}{D+B+\theta+\lambda}$

If on the contrary the first player loses he will still lack two games and the second player will also lack only two therefore by hypothesis the fraction of the first will be $\frac{D+B}{D+B+\theta+\lambda}$ Therefore in case of division the fraction of the first player will be $\frac{D+B+\theta+D+B}{2D+2B+2\theta+2\lambda}$ that is $\frac{H+E+C}{H+E+C+R+\mu}$ Q E D

This is also demonstrated in the same way of all the other bases because the foundation of this proof is that a base is always double the preceding base by the seventh consequence and that by the tenth consequence any number of cells of the same base is equal to the same number of cells of the preceding base (which is always the numerator of the player s fraction if he wins) together with the same cells lacking one (which is the numerator of the player s fraction if he loses) which being everywhere true in general the demonstration is always possible and universal

Problem 2 Proposition 2

Given two players each of whom stakes the same sum on a given number of games to find in the arithmetical triangle the part of the loser s money that the last game is worth to the winner

For example let two players each stake three pistoles on four games we want to find what part of the loser s 3 pistoles the last game is worth to the winner

Let there be taken the fraction of which the numerator is unity and the de nominator the sum of the cells of the fourth base since the set has four games I say that this fraction is the value of the last game in terms of the loser s money

For if when two players are playing for a set of four games one has three games to his credit and thus lacks one game and the other lacks four it has been demonstrated that the share of the first player for winning his first three games is expressed by the fraction $\frac{H+E+C+R}{H+E+C+R+\mu}$ which has as denominator the sum of the cells of the fifth base and as numerator its first four cells therefore there remains of the entire sum of the two stakes only the fraction $\frac{\mu}{H+L+C+R+\mu}$ which would belong to the player who already has the first three games if he won the last the value of this last in terms of the whole stakes is

$$\frac{\mu}{H+I+C+R+\mu} \text{ that is } \frac{\text{unity}}{2D+2B+2\theta+2\lambda}$$

But since the entire amount of the stakes is $2D+2B+2\theta+2\lambda$ the amount of each stake is $D+B+\theta+\lambda$ therefore the value of the last game in terms of the loser s stake only is the fraction $\frac{1}{D+B+\theta+\lambda}$ double the preceding fraction having as numerator unity and as denominator the sum of the cells of the fourth base Q E D

Problem 3, Proposition 3

Given two players each of whom stakes the same amount on a given number of games, to find in the arithmetical triangle the part of the loser's money represented by the value of the first game

For example, let two players each stake 3 pistoles on four games, we want to find what part of the loser's stake the first game is worth to the winner

Let there be added to the number 4 the number 3, less than it by unity, and let the sum be 7 Let there be taken the fraction which has as denominator the cells of the seventh base and as numerator the cell of the base cut by the bisector, that is, the fraction $\frac{\rho}{V+Q+K+\rho+\xi+N+\zeta}$ I say that this fraction satisfies the problem

For if when two players are playing for a set of four games the first player has one game to his credit, he will have three more to win and the second player will have four Therefore the first player's share of the whole amount of the stakes is the fraction $\frac{V+Q+K+\rho}{V+Q+K+\rho+\xi+N+\zeta}$ which has as denominator all the cells of the seventh base and as numerator its first four cells

Therefore $V+Q+K+\rho$ belongs to him out of the whole amount of the two stakes, expressed by $V+Q+K+\rho+\xi+N+\zeta$, but since this latter amount is the sum of the two stakes, he had himself staked half of it, namely $V+Q+K+\frac{1}{2}\rho$ (for $V+Q+K=\zeta+N+\xi$)

Therefore he has $\frac{1}{2}\rho$, that is, ω, more than he had at the beginning of the game, therefore he has won a portion of the total amount of the two stakes expressed by the fraction $\frac{\omega}{V+Q+K+\rho+\xi+N+\zeta}$ Therefore he has won a portion of the loser's stake double the above, namely a portion expressed by the fraction $\frac{\rho}{V+Q+K+\rho+\xi+N+\zeta}$

Therefore winning the first game has given the player that fraction, which is accordingly its value

Corollary

Therefore the part of the loser's stake representing the value of the first game out of two is expressed by the fraction ½

For to determine this value in accordance with the rule just given we must take the fraction which has as denominator the cells of the third base (because the number of games in the set is 2 and the number less by unity is 1, which taken together make 3) and as numerator the cell in the base cut by the bisector, therefore we shall have the fraction $\frac{\psi}{A+\psi+\pi}$

But the number of cell ψ is 2 and the number of cells A, ψ, π are 1, 2, 1

therefore we have the fraction $\frac{2}{1+2+1}$ that is ½

Therefore winning the first game has given the player that fraction, which is accordingly its value [illegible]

Problem 4 Proposition 4

Given two players each of whom stakes the same sum on a given number of games to find by the arithmetical triangle the value of the second game in terms of the loser s stake

Let the number of games in the set be four we must find the value of the second game in terms of the loser s stake

Let the value of the first game be found by the preceding problem I say that the value of the second game is the same

For when two players are playing for four games if one of them has two to his credit the fraction belonging to him is $\frac{P+M+F+\omega}{P+M+F+\omega+S+\delta}$ which has as de nominator the sum of the cells of the sixth base and as numerator the sum of the first four But he had staked the fraction $\frac{P+F+M}{P+M+F+\omega+S+\delta}$ that is half of the whole amount Therefore his winnings are the fraction $\frac{\omega}{P+M+F+\omega+S+\delta}$ which is the same as $\frac{\rho}{V+Q+K+\rho+\xi+N+\zeta}$ therefore he has won out of half the whole amount that is the loser s stake the fraction $\frac{2\rho}{V+Q+K+\rho+\xi+N+\zeta}$ double the preceding fraction

Therefore winning the first two games gave him this fraction of the loser s money which is double what the first game gave him by the preceding problem Therefore the second game gave him as much as the first

Conclusion

We easily conclude from the relation of the arithmetical triangle to the divisions which should be made between two players that the proportions between cells given in the *Treatise on the Triangle* have consequences extending to the value of divisions very easy to draw about which I have written a little treatise *dealing with divisions which explains why and how further extensions can be made*

USE OF THE ARITHMETICAL TRIANGLE TO FIND THE POWERS OF BINOMIALS

If it is proposed to find any power such as the fourth of a binomial of which the first term is A and the second unity that is if we want to find the fourth power of $A+1$ we must take in the arithmetical triangle the fifth base that is the base whose exponent 5 is greater by unity than 4 the exponent of the pro posed power The cells of the fifth base are 1 4 6 4 1 of which we must take the first number 1 as the coefficient of A in the proposed power that is of A^4 next we must take the second number of the base that is 4 as the coefficient of A in the next lower power that is of A^3 and take the following number of the base namely 6 as the coefficient of A in the next lower power that is of A^2 and take the following number of the base that is 4 as the coefficient of A in the

next lower power, that is, of A, and take the last number of the base 1, as it is. Thus we shall have $1A^4+4A^3+6A^2+4A+1$, which will be the fourth power of the binomial $A+1$. So that if A (which represents any number) is unity and therefore the binomial $A+1$ is the dyad, the power $1A^4+4A^3+6A^2+4A+1$ will be $1\ 1^4+4\ 1^3+6\ 1^2+4\ 1+1$, that is,

once the fourth power of unity (A), that is	1
four times the cube of 1, that is	4
six times the square of 1, that is	6
four times unity, that is	4
plus unity	1
which added together make	16

And the fourth power of 2 is in fact 16.

If A is another number, such as 4, and consequently the binomial $A+1$ is 5, then its fourth power will still be, in accordance with the above method,

$$1A^4+4A^3+6A^2+4A+1,$$

which now signifies

$$1\ 4^4+4\ 4^3+6\ 4^2+4\ 4+1,$$

that is,

once the fourth power of 4, namely	256
four times the cube of 4	256
six times the square of 4	96
four times the root 4	16
plus unity	1
the sum of which	625

is the fourth power of 5, as is indeed the case.

And similarly for all other examples.

If we want to find the same power of the binomial $A+2$, we must again take

$$1A^4+4A^3+6A^2+4A+1$$

and then write the four numbers, 2, 4, 8, 16, which are the first four powers of 2, under the numbers 4, 6, 4, 1, that is, under each of the numbers of the base beginning with the second, as follows:

$$\begin{array}{lllll} 1A^4 & +4A^3 & +6A^2 & +4A & +1 \\ & 2 & 4 & 8 & 16 \end{array}$$

and multiply the corresponding numbers by each other

$$\begin{array}{lllll} 1A^4 & +4A^3 & +6A^2 & +4A & +1 \\ & 2 & 4 & 8 & 16 \\ \hline 1A^4 & +8A^3 & +24A^2 & +32A & +16 \end{array}$$

as follows.

Thus we shall have the fourth power of the binomial $A+2$, so that if A is unity, the fourth power will be

once the fourth power of unity (A)	1
eight times the cube of 1	8
$24\ 1^2$	24
$32\ 1$	32
plus	16
of which the sum	81

will be the fourth power of 3, as it is in fact.

And if A is 2 then $A+2$ will be 4 and its fourth power will be

once the fourth power of A or 2 namely	16
$8\ 2^3$	64
$24\ 2^2$	96
$32\ 2$	64
plus the fourth power of 2	16
whose sum	256

will be the fourth power of 4

Similarly we shall find the fourth power of $A+3$ putting down in the same way $A^4+4A^3+6A^2+4A+1$ and underneath the numbers $3\quad 9\quad 27\quad 81$

$$A^4+12A^3+54A^2+108A+81$$

which are the first 4 powers of 3 multiplying the corresponding numbers we shall find the fourth power of $A+3$

And so on to infinity If instead of the fourth power we want the fifth power we must take the sixth base and proceed as I have indicated in the case of the fifth and similarly for all the other powers

We shall find in the same way the powers of the differences $A-1$ $A-2$ etc The method is exactly the same except for the signs the signs + and − succeed each other in alternation the sign + always coming first

Thus the fourth power of $A-1$ will be found as follows the fourth power of $A+1$ is by the preceding rule $A^4+4A^3+6A^2+4A+1$ Therefore changing the signs as indicated we shall have $A^4-4A^3+6A^2-4A+1$ Also the cube of $A-2$ will be found in the same way For the cube of $A+2$ by the preceding rule is $A^3+6A^2+12A+8$ Therefore the cube of $A-2$ will be found by changing the signs $A^3-6A^2+12A-8$ And so on to infinity

I do not demonstrate these things because others have already dealt with them as for example Herigogne besides they are evident in themselves

TREATISE ON THE ORDERS OF NUMBERS

I assume that the reader has read my treatise on the arithmetical triangle and its use for the orders of numbers if not I refer to it those who wish to read what follows which is simply a continuation of it

I defined what I mean by the orders of numbers there and I shall not repeat the definition

I also showed there that the arithmetical triangle is nothing but the table of the orders of numbers as a result of which it is evident that all the properties given in the arithmetical triangle concerning the relations between cells and between rows have their analogues in the orders of numbers so that if we possess even a little the art of applying the properties of one to the other there is no proposition in the treatise on the triangle which does not have its consequence for the different orders And they can be found with such ease and in such abundance that I am far from wishing to write them all out explicitly I should prefer leaving everything to the reader since it is all so easy But to avoid both these extremes I shall just give a few examples which will open the way to finding all the others

For example from what was said in one of the consequences of the *Treatise on*

the Triangle, namely, that each cell is equal to the immediately preceding parallel and perpendicular cells, I derive the following proposition for the orders of numbers

PROPOSITION 1

A number of any order whatsoever is equal to the number preceding it in its own order together with the number corresponding to it in the preceding order Consequently the fourth, for example, of the numbers of the fourth order is equal to the third number of the fourth order together with the fourth number of the third order Also the fifth number of the fifth order is equal to the fourth number of the fifth order together with the fifth number of the fourth order, etc

Another example From its having been shown in the triangle that each cell is equal to the parallel cell preceding it together with all the perpendicular cells preceding this parallel cell, for example, $\Gamma = E + B + \psi + \sigma$, I derive the following proposition

PROPOSITION 2

A number of whatsoever order is equal to the sum of the numbers whose root is less than its own by unity of its own and all preceding orders, and consequently the fourth number of the fourth order, for example, is equal to the third number of the fourth order plus the third number of the third order plus the third natural number plus the third number of the units, that is, unity

Whence we can now draw other consequences, such as the following, which I give to open the way to other similar ones

PROPOSITION 3

Every number, whatever its cell, is made up of as many numbers as there are orders from its own to the first, inclusive, each of the numbers representing one of the orders Thus a number of the fifth order is composed of another number of the fifth order, a number of the fourth order, a number of the third order, a natural number and unity

If we want to use this proposition for a problem we can enunciate it as follows

PROPOSITION 4, PROBLEM

Given a number of any order, to find a number in each order from the first to its own, inclusive, whose sum is equal to the given number

The solution is easy We must take in all these orders the numbers whose root is less by unity than that of the given number

Another example From the fact that reciprocal cells are equal it follows

PROPOSITION 5

That two numbers of different orders are equal if the [illegible] *of the other Consequently the third number of the* [illegible] *number of the* [illegible] *number of the fifth order*

We would never come to an end For example

PROPOSITION 6

All the fourth numbers of all the [illegible] *order* [illegible]

Because the parallel and perpendicular rows having the same exponent are composed of equivalent cells

By this method we shall find a wonderful correspondence in everything else as for example the following

PROPOSITION 7

A number of whatever order is to the next greater in the same order as the root of the lesser is to itself together with the exponent of the order diminished by unity

Which follows from the fourteenth consequence of the triangle where it is shown that each cell is to the immediately preceding parallel cell as the exponent of the base of the preceding cell is to the exponent of its perpendicular row

In order that no part of the method by which these correspondences are found remain hidden I shall make the relationship explicit It is a little more difficult here than above because we see no relationship between the base of the triangles and the orders of numbers This is the way to find it For *the exponent of the base* in the fourteenth consequence we must substitute *the exponent of the parallel row together with the exponent of the perpendicular row diminished by unity* Which gives the same number and with this advantage that we know the relation there is between these exponents and the orders of numbers for we know that in this new language we must say *the exponent of the order together with the root diminished by unity* I say all this that the method of making and facilitating these reductions may be available

Thus we shall find that

PROPOSITION 8

A number of whatever order is to the corresponding number of the following order as the exponent of the order of the lesser number is to itself together with the common root diminished by unity

This is the thirteenth consequence of the triangle Thus again we shall find that

PROPOSITION 9

A number of whatever order is to the number of the preceding order whose root is greater than its own by unity as the root of the first number is to the exponent of the order of the second

This is only the twelfth consequence of the arithmetical triangle

I omit many other propositions each of which as well as each of those I have just given can still be greatly increased by different enunciations for instead of expressing these proportions as I have by saying that *a number is to another as a third is to a fourth* may we not say that *the rectangle of the extremes is equal to that of the means* and thus multiply the propositions and not without utility for looked at from another side they open up other prospects?

For example if we wish to express this last proposition in another way we can enunciate it as follows

PROPOSITION 10

A number of whatever order when multiplied by the preceding root is equal to the exponent of its order multiplied by the preceding number of the following order

And because when four numbers are proportional, the rectangle of the extremes or of the means, when divided by one of the other two gives as quotient the remaining number, we can state the proposition as follows

PROPOSITION 11

A number of whatever order, when multiplied by the preceding root and divided by the exponent of its order, gives as quotient the preceding number of the following order

The ways of saying the same thing are infinite I cite an illustrious example and one that does me much honor This very proposition that I have just been turning about in several of its aspects occurred to our celebrated councilor of Toulouse, M de Fermat, and the wonderful thing is that without either of us having given the other any slightest hint of what we were doing he was writing in his province what I was discovering at Paris, and at the very hour as our letters written and received at the same time bear witness Happy to have concurred on this occasion as on others in a really extraordinary way with so great and admirable a man, who in all the investigations of the highest reaches of geometry is at the peak of excellence, as his works, which our long prayers have at last obtained from him, will soon make known to all the geometers of Europe, who are waiting for them! His way of taking the proposition is as follows

In the series of natural numbers beginning with unity the product of any number multiplied by the next higher is double the same number of the third order

The product of any number multiplied by the next higher number of the third order is triple the same number of the fourth order

The product of any number multiplied by the next higher number of the fourth order is quadruple the same number of the fifth order, and so on to infinity by a general and uniform method

See how enunciations can be varied! Since what I show for this proposition is to be understood of the rest, I shall not dwell longer on this convenient method but leave it to each to exercise his genius in these investigations which should claim all the study of mathematicians For if we cannot turn propositions in every direction and if we make use only of the first glimpse we had we shall never get very far It is these different roads that open up new consequences and by enunciations suited to the subject bind together propositions which seemed to be unrelated in the terms in which they were originally conceived I shall then go on with this subject in the usual geometrical way and what I say will amount to a new treatise on the orders of numbers I shall even present it in Latin because I happen to have written it in that language at the time of discovery

CORRESPONDENCE WITH FERMAT ON THE THEORY OF PROBABILITIES

LETTER FROM FERMAT TO PASCAL

[1654]

SIR

If I undertake to bring up a given face with a single die in eight throws and if we agree after the money has been staked that I shall not take my first throw I am entitled by my principle to withdraw from the game $\frac{1}{6}$ of the whole sum as compensation for having given up the said first throw

But if we again agree after that that I shall not take my second throw I am entitled to withdraw as indemnity $\frac{1}{6}$ of what is left which is $\frac{5}{36}$ of the whole

And if after that we agree that I shall not take my third throw my indemnity is $\frac{1}{6}$ of what is left which is $\frac{25}{216}$ of the whole

And if after that we again agree that I shall not take my fourth throw I should withdraw $\frac{1}{6}$ of what is left which is $\frac{125}{1296}$ of the whole and I agree with you that this is the value of the fourth throw on the assumption that I have already been compensated for the preceding throws But what you ask me to consider in the last example of your letter is (I use your own words) if I undertake to bring up a six in eight throws and have taken three without doing it if my fellow player asks me to give up my fourth throw but wants to compensate me for losing my chance $\frac{125}{1296}$ of the whole stakes will belong to me

But this according to my principle is not so For in this case since the player got nothing from his first three throws and the whole stakes are still in the game if he agrees not to take his fourth throw he should have as indemnity $\frac{1}{6}$ of the whole

And if he had thrown four times without bringing up the assigned face and it should be agreed he would not take his fifth throw he should still have as indemnity $\frac{1}{6}$ of the whole For as long as the stakes remain unchanged it not only follows from principle but it is also common sense that the odds are the same for every throw

I beg you then to let me know if we are at one on the principle as I believe we are and if we differ only in its application

I am etc.

FERMAT

LETTER FROM PASCAL TO FERMAT

July 29 1654

SIR,

I too am overcome by impatience and although I am still confined to my bed I can t resist letting you know that I received yesterday evening from M de Carcavi your letter on divisions (of stakes) which I admire more than I can tell you I haven t time to write at length but in a word your determination of the

divisions both for the dice and for the games is perfectly correct, which gives me great satisfaction, for now I can no longer doubt the truth of my results after finding myself in such wonderful agreement with you.

I admire your method for the games much more than for the dice. I had known several persons to discover the method for the dice such as the Chevalier de Méré, who first brought me these questions, and also M. de Roberval. But M. de Méré had never been able to find the right value of the games nor a way of getting there, so that I found myself alone in the knowledge of this proportion.

Your method is very reliable and is the first that occurred to me in this investigation, but because of the labor involved in using combinations I have found an abridgment of it, or rather a different method much shorter and simpler, which I should like to be able to tell you about here in a few words. For I should like henceforth to open my heart to you if possible, so great is my pleasure in our agreement. I see indeed that truth is the same at Toulouse and at Paris.

This is about the way I find the value of each game when two players are playing, for example, for three games and each has staked 32 pistoles on the play.

Let us suppose one player has two games and the other one. They now play a game of which the necessary consequence is that if the first player wins it, he wins all the money at stake, namely, 64 pistoles, and if the second player wins it, the score is two to two. Consequently if they wish to separate, each should withdraw his own stake, namely, 32 pistoles.

Consider then, Sir, that if the first player wins, 64 pistoles belong to him; if he loses, 32. Therefore if they wish not to venture this game and to separate without playing it, the first player should say: "I am sure of having 32 pistoles, for even if I lose, I get them. But as for the other 32, perhaps they will be mine, perhaps yours, the odds are even. Let us share these 32 pistoles equally therefore and give me in addition my own 32, which are mine in either case." He will have 48 pistoles then and the second player will have 16.

Let us suppose now that one player has two games and the other player none, and they are beginning a game with the following consequences: if the first player wins it, he takes all the money, 64 pistoles; if the second player wins it they are back at the preceding case, where one player has two games and the other one.

But we have already shown that in this case 48 pistoles belong to the player who has two games. Therefore if they wish not to play this game he should say: If I win I shall win the entire sum which is 64; if I lose 48 will legitimately be mine. Therefore give me the 48 which are mine even if I lose and let us share equally the other 16 since you have as much chance of winning them as I have. Thus he will have 48 and 8, that is 56 pistoles.

Finally let us suppose that one player has only one game and the other none. Clearly, Sir, if they begin a new game it follows that if the [illegible] he will have two games to his credit and consequently by the preceding case 56 pistoles will belong to him; if he loses, each has a game and therefore [illegible] pistoles belong to him. Therefore he should say [illegible] game give me 32 pistoles which are mine [illegible] of the 56 equally [illegible] and I take 12 which with 32 [illegible] 44.

[illegible]

of the loser s stake belong to the winner for the second game another 12 and for the last game 8

Now no longer to make a mystery of it since you see the whole thing perfectly clearly and I was being mysterious about it only to find out if I was not mistaken the value (I mean value in terms of the loser s money only) of the last game of two is double that of the last game of three and four times that of the last game of four and eight times that of the last game of five etc

But the proportion of the first games is not so easy to find This then is the way it is for I don t want to hide anything and here is the problem I was making so much of for indeed I am very much pleased with it

Given any number of games to find the value of the first

Let the given number of games be for example 8 Take the first eight even numbers and the first eight odd numbers namely 2 4 6 8 10 12 14 16 and 1 3 5 7 9 11 13 15

Multiply the even numbers as follows the first by the second the product by the third the product by the fourth the product by the fifth etc Multiply the odd numbers in the same way the first by the second the product by the third etc

The last product of the even numbers is the denominator and the last product of the odd numbers is the numerator of the fraction expressing the value of the first game of eight that is if each player stakes the number of pistoles expressed by the product of the even numbers the number of the loser s pistoles belonging to the winner will be expressed by the product of the odd numbers

Which is demonstrated but with much labor by combinations used in the way you thought of I have not been able to demonstrate it in that other way I was just telling you about but only by the method of combinations Here are the preliminary propositions which are simply arithmetical propositions about combinations of which I have found some rather nice properties

If in any number of letters for example 8 *A B C D E F G H* you take all the possible combinations of 4 letters and then all the possible combinations of 5 letters and then of 6 of 7 and of 8 and thus you take all the possible combinations from the number which is half the whole up to the whole I say that if you add together half the combinations of 4 and all the higher combinations the sum will be the number of the quaternary progression beginning with the dyad which corresponds to half the number of letters

For example and I ll write it in Latin for French is no good here

If in as many letters as you please for example 8 *A B C D E F G H* all combinations of 4 5 6 etc up to 8 are taken I say that if you add together half the combinations of 4 namely 35 (half 70) all the combinations of 5 namely 56 all the combinations of 6 namely 28 all the combinations of 7 namely 8 and all the combinations of 8 namely 1 you have the fourth number of the quaternary progression beginning with 2 I say *fourth number* because 4 is half of 8

For the numbers of the quaternary progression beginning with 2 are 2 8 32 128 512 etc. of which 2 is the first, 8 the second 32 the third and 128 the fourth which 128 is equal to 35 half the combinations of 4 letters +56 the combinations of 5 letters +28 the combinations of 6 letters +8 the combinations of 7 letters +1 the combination of 8 letters

Sex+Antibiotics in rat
Dickson et al C3982/54 (weight)
Sex+Fish solubles in rat
Dickson et al C3982/54 (weight)
Gonadectomy in ass and mule
Frazao C2809/54 (histology lipids)
Ovariectomy in mouse
Runner and Dickie C4407/55
(weight histology tumor)
Ovariectomy in rat
Cardeza C6748/54
(histology tumor)
Houssay et al C2229/54
(tumorigenesis)
Kullander C1872/54
(weight histology)
Ovariectomy+Ovarian transplant
(submammary) ↑ in guinea pig
Mosinger C201/54 (weight)
Ovariectomy+Ovarian transplant
in mouse
Hummel C1479/54 (tumorigenesis)
Ovariectomy+Ovarian transplant in spleen
in rat
Bormann et al C6002/55 (weight)
Kullander C1872/54
(weight histology)
Ovariectomy+Folliculoids in rat
Arzac C6647/55 (X zone)
Houssay et al C6752/54
(histology tumor)
Ovariectomy+Folliculoids+Luteoids
in rat
Frazao C2809/54
(histology lipids)
Ovariectomy+Thyroxin in rat
Houssay et al C6752/54
(histology tumor)
Ovariectomy+Pancreatectomy (partial)
in rat
Houssay et al C6752/54
(histology tumor)
Ovariectomy+Uterus extirpation in rat
Hamilton C1631/54 (weight
ascorbic acid lipids)
Ovariectomy+Antibiotics in rat
Dickson et al C3982/54 (weight)
Ovariectomy+Fish solubles in rat
Dickson et al C3982/54 (weight)
Ovariectomy+Histamine in rat
Houssay et al C6752/54
(histology tumor)
Ovariectomy+Starvation in mouse
Visscher and Halberg C3418/55
(ascorbic acid)
Ovarian transplant (immature in testis) ↑
in rat
Fazzari B98383/53 (fasciculata)

Folliculoids (discussion)
Black C4351/55
(histology triphenyltetrazolium
technique for dehydrogenase in vivo
and in vitro)
Folliculoids ↑
Chamorro C2077/54 (weight)
Folliculoids ↑ in cattle
Clegg and Cole C158/54 (weight)
Folliculoids ↑ in hamster
Horning and Whittick C1859/54
(tumorigenesis)
Folliculoids in monkey
Riviere and Combescot B96903/53
(fatty degeneration histologic
activity)
Folliculoids in rat
Frazao C2809/54 (histology lipids)
Hoch Ligeti and Irvine C433/54
(weight/body weight)
Folliculoids ↑ in rat
Deschn C1193/55 (weight)
Ichikawa B97700/53
(weight/body weight)
Perolo B96921/53 (size lipids)
Folliculoids ↑ in sheep
Clegg and Cole C158/54 (weight)
Folliculoids (chlorotrianisene) Ø in man
Carroll and Brennan C1789/55
(histology)
Folliculoids+Thyroidectomy ↓
Chamorro C2077/54 (weight)
Folliculoids+Thiourea ↓ in rat
Deschn C1193/55 (weight)
Folliculoids+Age (larval) in frog
Chang and Witschi C4490/55
(weight histology)
Folliculoids+Carcinogen+Diet in rat
Gyarmati C5345/53 (weight)
Folliculoids+Casein+Protein deficiency
in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Folliculoids+Tannic acid in rat
Sztanojevits et al C5481/54
(histology lipids)
Folliculoids+Diet in rat
Glaser and Leathem C3563/55
(weight lipids)
Gyarmati C5345/53 (weight)
Folliculoids+Protein deficiency in rat
Aschkenasy and Dray B99608/54
(weight)
Glasser and Leathem C3563/55
(weight lipids)
Luteoids ↑ in monkey
Riviere and Combescot B96903/53
(degeneration of fasciculata)

Luteoids in rat
Byrnes and Shipley C6329/55 (weight)
Frazao C2809/54 (histology lipids)
Hoch Ligeti and Irvine C433/54 (weight/body weight)
Luteoids+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (histology PAS tingible bodies)
Hydroxyprogesterone in rat
Byrnes and Shipley C6329/55 (weight)
Ford B98699/54 (weight)
11 keto-progesterone in rat
Byrnes and Shipley C6329/55 (weight)
Estrus in rat
Schwartz and Shirky C1653/54 (weight ascorbic acid)
Pregnancy in monkey
Smith C2760/55 (weight histology)
Pregnancy in rat
Schwartz et al C6342/55 (weight ascorbic acid)
Pregnancy+Lactation+Hyperovarianism (spontaneous) in mouse
Atkinson et al B97429/54 (A cells leucocytic infiltration *myelopoiesis*)
Pregnancy+Age (foetal)
Lanman C116/53 (histology)
Pregnancy+Age (embryonal) in cat
Graham C5846/54 (sex chromatin)
Pregnancy+Age in man
Frazao C2809/54 (histology of zones lipids)
Pregnancy+Age (foetal) in rat
Cohen C2076/54 (lipids)
Pregnancy+Histamine in guinea pig
Trassoli C1425/54 (histology)
Pregnancy+Na deficiency in rat
Figer et al B98_58/53 (histology phosphatase)
Pseudopregnancy in rat
Schwartz et al. C6342/55 (weight ascorbic acid)
Sex (♀)+Pinealectomy in rat
Thieblot B98670/54 (weight)
Sex (♀)+Pinealectomy ↑ in rat
Thieblot B98670/54 (ascorbic acid cholesterol)
Sex (♀) ↓+Stress in rat
Ralli C3451/54 (cholesterol)
Testis extirpation ↑↓ in hamster
Teodoru and Shwartzman C1066/54 (*weight/body* weight)
Testis extirpation ↑ in rabbit
Maqsood B97111/54 (weight)
Testis extirpation, in rat
Cardesa C6748/54 (histology tumor)
Testis extirpation ↑ in rat
Ichikawa B97700/53 (weight/body weight)
Testis extirpation+Testoids in rat
Arzac C6647/55 (X zone)
Frazao C2809/54 (histology lipids)
Testis extirpation+Testoids ↓ in rat
Ichikawa B97700/53 (weight/body weight)
Sforzini C86/53 (weight)
Testis extirpation+Testoids ↑ in rat
Sforzini C3218/53 (lipids cholesterol)
Testis extirpation Ø+Trauma nerves (immobilization) in dog
Ganong and Junker C733/55 (weight, histology)
Testis extirpation+Antibiotics fish solubles *in rat*
Dickson et al C3982/54 (weight)
Testoids (discussion)
Black C4351/55 (histology triphenyltetrazolium technique for dehydrogenase in vivo and in vitro)
Testoids (methyltestosterone) ↓ in cattle
Krueger et al C1639/54 (weight)
Testoids ↑ in monkey
Riviere and Combescot B96903/53 (degeneration of fasciculata)
Testoids in rat
Frazao C2809/54 (histology lipids)
Hoch Ligeti and Irvine C433/54 (weight/body weight)
Sforzini C86/53 (weight)
Testoids+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (histology PAS tingible bodies)
Testoids+Age (larval) in frog
Chang and Witschi C4490/55 (*weight histology*)
Testoids ↓+Age (newborn) in rat
Contopoulos et al C1899/55 (weight)
Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Testoids+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
MAD in rat
Loustalot C6033/55 (*PAS positive structures*)
MAD+Thyroidectomy+*Nephrectomy* (partial)+*NaCl*, in rat
Salgado C1002 54
(weight histology hyaline granules)

MAD+Nephrectomy (partial)+Renin+
NaCl in rat
Masson et al C4482/55
(weight histology lipids PAS granules)
MAD+Nephrectomy (partial)+NaCl
in rat
Salgado C1002/54
(weight histology hyaline granules PAS tingible bodies)
MAD ↑+NaCl in rat
Skelton C5313/55 (weight)
MAD+NaCl+Urea ↓ in rat
Skelton C5313/55 (weight)
Pregnenolone in rat
Frazao C2809/54 (histology lipids)
Sex (♂) ↑ in rat
Kalant and Sellers C268/54
(succinoxidase)
Tadokoro B98241/54
(size of transitional zone)
Sex (♂)+Pinealectomy ↓ in rat
Thieblot B98670/54
(weight ascorbic acid, cholesterol)
Sex (♂)+Age (adult) in rat
Ichikawa B97698/53
(weight/body weight)
Thyroidectomy ↓ in rabbit
Maqsood B97111/54 (weight)
Thyroidectomy+Nephrectomy (partial)+
NaCl in rat
Salgado B98385/54 C1002/54
(weight)
Thyroidectomy+Renal lesion+Prostatectomy in rat
Lehr and Martin C5267/55 (weight)
Martin and Lehr C5274/55 (weight)
Thiourea
West C4904/54 (DOPA)
Thiourea ↓ in fowl
Pino et al B99666/54
(weight/body weight)
Thiourea in guinea pig
Kowalewski et al C6032/54
(weight histology)
Thiourea in rat
d Antuono and Pieragnoli C3256/55
(histology alkaline phosphatase nucleic acid)
Kracht C1125/54
(nuclear diameter histology)
Thiourea Ø in rat
Freedman and Gordon C1799/55
(ascorbic acid cholesterol)
Thiourea ↓ in rat
Freedman and Gordon C1799/55
(weight)
Nicholls and Rossiter C4483/55
(weight)
Steger B96883/53
(alkaline phosphatase)

Thiourea+Thyroxin in rat
Nicholls and Rossiter C4483/55
(phosphorus radioactive)
Thiourea (into yolk sac)+Age
(embryonic) in fowl
Kingsbury et al. C2762/55
(weight histology ascorbic acid cholesterol lipids)
Thiourea+Age (embryonic) in fowl
Kingsbury et al C5463/54
(weight, ascorbic acid cholesterol lipids)
Thiourea+Cold in rat
Freedman and Gordon C1799/55
(weight ascorbic acid cholesterol)
Nicholls and Rossiter B98886/54
C4483/55 (phosphorus radioactive)
Thiourea+Cold+Ascorbic acid in rat
Freedman and Gordon C1799/55
(weight)
Thiourea+Enheptin ↑ in fowl
Pino et al B99666/54
(weight/body weight)
Thyroid extract in rat
Franko C6468/52
(weight, phosphatase)
Minder and Abelin C5532/54
(weight)
Thyroxin in dog
Katsura C2178/54
(succinic oxidase of adrenal cortex homogenate)
Thyroxin in guinea pig
Enrico C99/53 (histology)
Thyroxin in rat
d Antuono and Pieragnoli C3256/55
(histology alkaline phosphatase nucleic acid)
Hoch Ligeti and Irvine C433/54
(weight/body weight)
Nicholls and Rossiter C4483/55
(phosphorus radioactive)
Thyroxin+Age in rabbit
Maqsood B97111/54 (weight)
Thyroxin Ø+Age (newborn) in rat
Contopoulos et al C1899/55
(weight)
Thyroxin ↑ (to mother)+Age (newborn)
in rat
Kenshalo C3800/54 (weight)
Thyroxin+Casein+Protein deficiency
in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Thyroxin+Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight/body weight)
Parathyroidectomy+Nephrectomy
(partial)+ERH (cellophane wrapping) in rat
Eger B98259/53
(weight histology lipids)

Parathyroid hormone Ø + Tuberculosis in guinea pig
Schafer B99[illegible]14/54 (histology)
Pancreatectomy in dog
Yosioka B95065/54 (histology)
Alloxan
West C4904/54 (DOCA)
Alloxan ↓ in rabbit
Nagahama B96563/53 (lipids)
Alloxan in rat
Eger B98261/ND (histology)
Weller and Bettge B96908/54 (histology function)
Alloxan ↓ in rat
Dury B98144/54 (ascorbic acid cholesterol)
Eger B98261/ND (lipids)
Field C4477/55 (cholesterol, lipids)
Alloxan ↑ in rat
Field C4477/55 (weight)
Alloxan + Insulin ↓ in rat
Field C4477/55 (weight)
Alloxan + Insulin ↑ in rat
Field C4477/55 (cholesterol, lipids)
Insulin in rat
Abelin and Pfister B96674/54 (ascorbic acid)
Eranko C6468/55 C6595/55 (weight phosphatase adrenal medulla fluorescing islets)
Hoch Ligeti and Irvine C4553/54 (weight/body weight)
Insulin ↓ + Glucose in rat
Abelin and Pfister B96674/54 (ascorbic acid)
Glucagon (discussion) in rat
Cavallero et al C1409/52
C2058/52 (weight histology)
Glucagon Ø in rat
Galansino et al C1626/54
C2464/55 (weight histology)
Diabetes mellitus (spontaneous) in dog
Wrenshall et al C3686/54 (histology)
Pinealectomy Ø in fowl
Negri and Marconi B98104/54 (histology)
Pineal extract in guinea pig
Giordano and Alcozer B98282/53 (histology)
Pineal extract ↑ in rat
Bergmann B97105/54 (weight)
Thymectomy Ø in rat
Ogawa and Itagaki B95640/54 (phosphorus radioactive)
Shibata et al B97619/52 (weight)
Thymectomy (partial) in guinea pig
Gyllensten and Ringertz C1294/54 (phosphorus radioactive)
Thymus *extract in rat*
Matteini and Marabini B99837/53 (weight)

Lymph node extract in rat
Matteini and Marabini B99837/53 (weight)
Splenectomy Ø + Ascorbic acid deficiency in guinea pig
Gabe and Larrot B99783/52 (weight)
Nephrectomy (partial) + ERH (cellophane wrapping) in rat
Eger B98259/53 (lipids)
Nephrectomy (partial) + Kidney vessel ligature + NaCl in rat
Loustalot C6633/55 (PAS positive structures)
Liver extract in rat
Matteini and Marabini B99837/53 (weight)
Inflammation (anaphylactoid after egg white i p) Ø in rat
van Cauwenberge et al. C1974/53 (cholesteol)
Inflammation (anaphylactoid after egg white i p ↓) in rat
van Cauwenberge et al. C1974/53 (ascorbic acid)
Inflammation (after turpentine) ↓ in rat
Glick and Ochs C2761/55 (cholesterol)
Inflammation (after allylformate i p) + *Dye in rat*
Samaras et al C1650/54 (histology)
Age
Frazao C2809/54 (histology of zones lipids ascorbic acid—review)
Schoen C2040/54 (rhodiochromic chromotropic substances)
Weissbecker C3457/54 (function—review)
Age (newborn)
Brodeur B97190/54 (function—review)
Age (newborn) in man
Hadhazy et al B99920/54 (histology)
Age in rat
Hebert and Barbarin C117/ND (histology lipids cholesterol esterase)
Hebert et al B99612/54 (histology)
Kalant and Sellers C268/54 (succinoxidase)
Loustalot C6633/55 (PAS positive structures)
Aging ↓ in rat
DaCosta et al B99086/54 (weight/body weight)
Aging ↑ in rat
Da Costa et al B99086/54 (absolute weight)

(Cold+Muscular exercise) ↑ in rat
Badrick et al C4501/55
(phosphorus radioactive)
Cold+Ascorbic acid Ø
Knobil and Fregly C4495/55
(weight cholesterol)
Hibernation in hamster
Deane and Lyman B97428/54
(histology)
Hibernation ↓ in hamster
Deane and Lyman B97428/54
(weight)
Hibernation in hedgehog
Suomalainen C852/53 (cholesterol)
Hibernation (artificial) ↓
Egana et al C2219/54
(respiratory quotient)
Ionizing rays in guinea pig
Rosenthal C4545/55 (hemorrhage)
Ionizing rays (gamma) in monkey
Lushbaugh and Houck C5311/55
(histology)
Ionizing rays in mouse
Haase and Kroning C1153/54
(histology adrenal medulla weight
adrenal cortical weight)
Rugh B98033/54 (dry weight
wet weight water percentage)
Ionizing rays (thermal neutron) ↑
in mouse
Upton et al B99035/54
(tumorigenesis)
Ionizing rays in rat
Kivy Rosenberg et al. C4352/55
(histology triphenyltetrazolium
technique for dehydrogenase in
vitro)
Ionizing rays ↓ in rat
Hochman and Bloch Frankenthal
B98726/53 (ascorbic acid)
Kivy Rosenberg et al C4352/55
(lipids)
Ionizing rays+Anesthetic (barbiturates)
in rat
Bacq C5467/55 (ascorbic acid)
Ionizing rays+Anesthetic (barbiturate) ↑
in rat
Bacq C5467/55 (cholesterol)
Ionizing rays+Cysteamine in rat
Bacq et al C5468/54 (weight,
ascorbic acid cholesterol)
Ionized air (positively negatively) in rat
Nielsen and Harper B98151/54
(succinoxidase)
Electroshock ↑ in mouse
Timiras et al B99494/54 (weight)
Electroshock, in rat
Nielsen and Harper B98151/54
(succinoxidase)
Royce and Rosvold B98318/53
(weight cholesterol ascorbic acid)

Electrotrauma in guinea pig
Sanfilippo and Sgro C1995/53
(ascorbic acid)
Ultrasonics in rabbit and rat
Gloggengiesser and Lukas B96704/53
(vessel dilatation in medulla)
Nerves (emotions) ↓ in cat
Schunk C2920/54 (lipids)
Nerves (confinement)
in fowl and pheasant
Greeley C6617/55 (cholesterol)
Nerves in rat
Cheymol et al. C3366/54
(emotion ↓ → ascorbic acid)
Guillemin C2756/55
(immobilization ↓ → ascorbic acid)
Kimura C6602/54 (pain →
ascorbic acid)
Weisz et al C4643/54 (emotion
conditioned reflex → ascorbic acid)
Nerves (emotion)+ABA (chlorpromazine),
in rat
Cheymol et al C3366/54
(ascorbic acid)
Nerves (immobilization) ↓+ABA
(atropine) in rat
Guillemin C2756/55 (ascorbic acid)
Muscular exercise in guinea pig
Beickert C5571/54 (weight)
Muscular exercise in rat
Allara C120/53 (nucleic acid)
Hypoxia Ø in rat
Clark et al C5066/55 (weight)
Hypoxia ↓ in rat
Weisz et al C4643/54
(ascorbic acid)
Hypoxia ↑ in rat
van Liere and Fedor C4567/55
(weight)
Hypoxia+Vitamin E in rat
Saha C5572/54 (histology)
Oxygen (at high pressure) ↑ in rat
Bean and Johnson C1583/54
(weight, histology)
Atmospheric high pressure in guinea pig
Cali B96317/53 (ascorbic acid)
Fradà and Cali B96027/53
(size lipids)
Serum ↓ in rat
Coste et al B93715/53
(ascorbic acid)
Vaccine ↓ in rabbit
Summa and Volpicelli B99843/53
(lipids)
ABA (pendiomid) in guinea pig
Muller B99876/54 (histology)
ABA (dibenzyline) ↓ in rat
Cronheim and Koster C5244/55
(ascorbic acid)
ABA (various) in rat
Shibata et al. C312/54 (weight)

ABA (atropine) + Acetylcholine derivatives Ø in rat
Guillemin C2756/55 (ascorbic acid)

ABA + Anesthesia + Stress in rat
Castaigne C6070/52 (ascorbic acid)

ABA (chlorpromazine) + Formalin in rat
Cheymol et al C3360/54 (ascorbic acid)

ABA (atropine) + Formalin ↓ in rat
Guillemin C2756/55 (ascorbic acid)

ABA (dibenzyline SKF-501) + Formalin ↓ in rat
Guillemin C2756/55 (ascorbic acid)

ABA (antihistamine) + Histamine in rat
Prassoli C1426/54 (histology)

ABA (dibenzyline) + Salicylate ↓ in rat
Cronheim and Koster C5244/55 (ascorbic acid)

Acetylcholine in guinea pig
Prassoli C1424/54 (histology)

Acetate radioactive + Ascorbic acid deficiency ↑ in guinea pig
Becker et al. C1679/53 (cholesterol radioactive)

Acetyl pyridine + Nicotinamide in mouse and rat
Hicks C5871/55 (necrosis in adrenal medulla)

Alcohol in guinea pig
Forbes and Duncan C274/54 (ascorbic acid)

Alcohol ↓ in guinea pig and rat
Forbes and Duncan C1437/51 C1438/53 (ascorbic acid, cholesterol)

Alcohol + Ascorbic acid in guinea pig and rat
Forbes and Duncan C1439/53 (ascorbic acid cholesterol)

Alcohol + Ascorbic acid deficiency in guinea pig
Forbes and Duncan C1440/53 (ascorbic acid cholesterol)

Aminopterin in rat
Lewis et al B92668/53 (weight histology)
Schwartz et al. B98155/54 (ascorbic acid)

Aminothiazol in monkey
Rivière and Combescot B96903/53 (histologic activity)

Anesthetic (chloroform) Ø in guinea pig
Sudeck C1128/54 (histology nuclear diameter)

Anesthetic in rat
Hoch Ligeti and Irvine C433/54 (weight/body weight)

Anesthetic (barbiturate) ↑ in rat
Woodbury B98594/54 (weight)

Anesthetic (barbiturate) + Cardiazol coramine in rat
Bertelli and Rovati C604/53 (ascorbic acid)

Anesthetic (barbiturate) Ø + Cysteamine in rat
Bacq et al C5468/54 (ascorbic acid)

Anesthetic (barbiturate) + Histamine Ø + Morphine in rat
Munson C6117/54 (ascorbic acid)

Anesthetics (chloral hydrate urethane) + Salicylate in rat
Cronheim and Koster C5244/55 (ascorbic acid)

Antibiotic in dog
Lee et al C3356/53 (antibiotic)

Antibiotic (penicillin) in guinea pig
Sacenti C4286/54 (histology)

(Ascorbic acid + Nicotine) ↓ in frog
Venulet B96354/54 (ascorbic acid)

Ascorbic acid + Thiosemicarbazone in guinea pig
Steege and Pirtkien C1058/53 (histology)

Ascorbic acid + Stress in rat
Ralli C3451/54 (cholesterol)

ATP ↓ in rat
David and Montersino B98312/53 (ascorbic acid)

Benzoylcarbinol derivatives in rat
Cresseri and Meli C[illegible]23/53 (weight)

Blood in cattle
Rosenfeld C6318/55 (ascorbic acid in perfused adrenal)

Blood transfusion in man
Salfelder B96725/53 (hemorrhage)

Blood (from hypothalamico-hypophysial portal vessel blood of dog) in rat
Porter et al C5138/55 (weight histology)

Carbon dioxide in guinea pig
Schaefer C5148/55 (weight cholesterol)

Carbon dioxide in guinea pig and rat
King and Schaefer C[illegible]301/54 (weight cholesterol)
Schaefer and King C1651/54 (cholesterol)

Carbon dioxide ↓ in rat
King and Schaefer C1656/54 (cholesterol)
Langley and Kilgore C4136/55 (ascorbic acid cholesterol)

Cardiazol ↓ in rat
Bertelli and Rovati C604/53 (ascorbic acid)

CCl_4 in rabbit
Ichida B97676/52 (histology)

Cholesterol in rabbit
Johansson C247/54 (histology)

Colchicine ↓ in guinea pig
Lucherini et al C3912/54
(histology lipids)
Coramine ↓ in rat
Bertelli and Rovati C604/53
(ascorbic acid)
Cystamine Ø cysteamine Ø in rat
van Cauwenberge et al. B99638/54
(cholesterol)
Cystamine ↓ cysteamine ↓ in rat
van Cauwenberge et al B99638/54
(ascorbic acid)
Cysteinamine ↓ in rat
Morsdorf et al C6679/55
(cholesterol ascorbic acid)
Cysteine Ø in rat
van Cauwenberge et al B99638/54
(cholesterol)
Cysteine ↓ in rat
van Cauwenberge et al B99638/54
(ascorbic acid)
Cystinamine ↓ in rat
Morsdorf et al *C6679/55*
(cholesterol ascorbic acid)
Desoxypyridoxin
West C4904/54 (DOPA)
Drugs (SC 4473 SC 3402) in rat
Sturtevant C2757/55 (weight)
Drug (SKF 2599) in rat
Woodbury et al. C2800/55
(weight ascorbic acid)
Dye in rabbit
Elkeles C295/54 (staining)
Ephetonin ↑↓ *in rat*
Gillissen and Merschkotter C4641/54
(nuclear volume)
Ergosterol radioactive in rat
Hanahan and Wakil B97963/53
(radioactivity)
Ethionine
West C4904/54 (DOPA)
Ethyl alcohol+Pantothenic acid deficiency
thiamine deficiency in rat
Duncan and Forbes C5187/55
(ascorbic acid cholesterol)
Eugenol (per os) ↓ in guinea pig
Breidenbach and Ray B96628/53
(ascorbic acid)
Foam rubber (i p) in rat
Pecchiai C9/54 (histology)
Formalin in rat
Cheymol et al C3366/54
(ascorbic acid)
Ichikawa B97699/53
(weight/body weight)
Tadokoro B98241/54 (lipids)
Yoshimura C2807/54
(histology of zones)
Fructose ↓ in rat
Abelin and Pfister B96674/54
(cholesterol percentage)

Glucose in guinea pig
Abelin and Pfister B96674/54
(cholesterol percentage
ascorbic acid)
Glucose ↓ *in rat*
Abelin and Pfister B96674/54
(ascorbic acid)
Gold in guinea pig
Kleinsorge et al C697/54 (gold)
Heparin in rabbit
de Matteis B97350/54
(weight histologic changes)
Histamine in guinea pig
Prassoli C1424/54 (histology)
Histamine ↓ in rat
Munson C6117/54 (ascorbic acid)
Histamine Ø+Morphine (several
injections) in rat
Munson C6117/54 (ascorbic acid)
Histamine releaser (cpd. 48/80) ↓ in rat
Nasmyth C4608/55 (ascorbic acid)
Hydantoin derivative in mouse
Staple B96745/54 (histologic
lesions weight/body weight)
Hydantoin derivative in rat
Endroczi et al B99641/54
(ascorbic acid)
Woodbury B98594/54
(ascorbic acid)
Woodbury et al C2800/55
(ascorbic acid)
Isonicotinic acid hydrazide in guinea pig
Besta et al B99107/54 (histology)
Leucine ↓ in rat
Goth et al C3488/55 (ascorbic acid)
Liquorice in guinea pig
Capretti and Magnani B96780/53
(histology)
Lithospermum (suspension) in rat
Slusher B98713/54 (weight
cholesterol ascorbic acid)
Methyldiphenylcarbometoxyketopropane
diol in rat
Cresseri and Meli C523/53 (weight)
Morphine ↓ *in rat*
Nasmyth C2716/54 (ascorbic acid)
Na in rat
Stoerk et al C4084/55
(glomerulosa)
NaCl in rat
Eranko C2188/55 (weight
histology of zones lipids in adrenal
cortex chromaffin reaction in
adrenal medulla)
Kivy Rosenberg et al C4352/55
(histology triphenyltetrazolium
technique for dehydrogenase *in
vitro*)
Na bromide Ø in mouse and rat
Raubitschek B96706/54 (histology)

Starvation Ø in guinea pig
Toffey C3633/55 (lipids alkaline phosphatase in zones)
Starvation in hamster
Knigge C2614/54 (weight histology lipids cholesterol alkaline phosphatase esterase) C3678/55 (weight histology)
Starvation in man
Paullada C5443/55 (histology)
Wehlinger C3638/55 (histology lipids)
Zubiran et al C3157/54 (histology)
Starvation in pheasant
Greeley C6617/55 (cholesterol)
Starvation ↓ in rat
DaCosta et al. B99086/54 (absolute weight)
Starvation ↑ in rat
DaCosta et al B99086/54 (weight/body weight)
Starvation+Refeeding ↑ in rat
DaCosta et al. B99086/54 (weight)
Ascorbic acid deficiency ↓ in guinea pig
Pihero and Gordon C5062/54 (ascorbic acid)
Ascorbic acid deficiency ↑ in guinea pig
Prunty et al C3652/55 (weight/body weight)
Ascorbic acid deficiency in monkey
Glick and Ochs C2761/55 (cholesterol)
Nayyar and Glick C729/55 (β glucuronidase)
Histidine deficiency ↓ in rat
Scott B97489/54 C2639/54 (weight histology)
Na deficiency in guinea pig and rat
Eger et al B98258/53 (histology phosphatase)
Na deficiency in rat
Stoerk et al C4084/55 (glomerulosa)
Pantothenate deficiency ↓+Stress in rat
Ralli C3451/54 (cholesterol)
Potassium deficiency in rat
Stoerk et al C4084/55 (glomerulosa)
Vitamin A deficiency in rat
Stoerk et al C1069/52 (hyaline droplets)
Dehydration in rat
Kimura C6602 54 (ascorbic acid)
Diurnal variations in mouse
Bander C3745/53 (histology lipids)
Diurnal variations in rat
Wexler et al C735/55 (lipids in glomerulosa)

Season in fowl and pheasant
Greeley C6617/55 (weight)
Season (summer) ↓ in hamster
Teodoru and Shwartzman C1066/54 (weight/body weight)
Season in hedgehog
Suomalainen C852/53 (cholesterol)
Season (summer) ↓ in rabbit
Maqsood B97111/54 (weight)
Stress in dog
Malméjac et al. C3811/54 (ascorbic acid)
Stress (acute chronic) in man
Currie and Symington C3656/55 (histology lipids)
Stress in man
Symington et al C3637/55 ('Tubules focal lipid depletion chromidiosis nucleic acid phosphatase esterase)
Stress in mouse
Tonutti C1829/54 (morphokinesis)
Stress ↑ in rat
Thiele C5094/54 (plasmalogen)

ADRENAL DISEASES

Hypocorticoidism (Addison s Disease)

Review
Forsham and Reyes B97315/54
Houli C5448/54
Ravault et al C4522
de Salcedo C1419/53
Weissbecker C3437/54

Pathogenesis
Azerad and Grupper B93716/53 (pemphigus moranyl)
Cheyne and Whitehead B98415/54 (alkali treatment)
de Gennes C1118/54 (pernicious anemia diarrhea tropical sprue)
de Gennes et al B99620/54 (intestinal stenosis)
de Grailly et al C589/53 (trauma)
Gros and Weiss C1271/54 (ACTH and/or cortisone)
Keitzer and Cheek B99525/54 (substituting cortisol for cortisone)
Steinberg et al C418/54 (hypophysis)
Tuchmann and Leupold C5661/55 *(G-A S with diabetes mellitus)*
Weissbecker C3437/54 (review)

Hypocorticoidism ← Various

Adrenalectomy+DOCA
Bergenstal et al C3657/55
ACE+DOC
Pana et al. B99756/53

Corticoids
Thorn et al. B97168/54 (review)
Cortisone+DOCA
Anonymous B99713/54 (discussion)
Flink C1458/54
Cortisone+DOCA+Insulin+ Diabetes mellitus
Stanton et al. B98506/54
Cortisone+DOC (trimethylacetate)
Flink C1458/54
Cortisol
de Gennes et al. C6446/55 (free alcohol)
Hart C6389/55 (i v)
Nabarro C1786/55 (i v)
Rukes et al. B99437/54 (free alcohol i v) C6231/55 (i v)
Cortisol+DOCA
Flink C1458/54
Cortisol+DOC (trimethylacetate)
Flink C1458/54
Fluorocortisol
Goldfien et al. C3960/55
DOCA+Age (newborn)
Briggs et al B97024/53
Aldosterone
Anonymous B99713/54 (discussion)
Mach and Fabre C3626/54 C3654/55
Thorn C5407/55
Cpd B
Thorn et al C3653/55 (discussion)
Pregnancy
Halberg and Kaiser B97577/54
Pregnancy+Diabetes mellitus
Gurling et al B96836/54
Liquorice
Groen et al B98464/53 (discussion)
Revers B96649/53
Strong and Wilson C1388/55
Diet
Travia C305/53

Hypocorticoidism → Targets

Resistance ← Pregnancy
Hills et al B99410/54
Glucose in blood ← Cortisone withdrawal +Diabetes mellitus+Glucose+ Pregnancy
Gurling et al B96836/54
Glucose in blood ← Cortisone+Glucose+ NaCl
Frawley C6218/55 C6233/55
Glucose in blood ← Cortisol (i v)
Frawley C6233/55
Glucose in blood ← Cortisol+Fasting
Frawley C6218/55
Glucose in blood ← Aldosterone ↑
Prunty et al B98213/54
Glucose in blood ← Aldosterone+Glucose
Mach and Fabre C3636/54
Glucose in blood ← Insulin
Cleempoel and Conard C3918/53
Noguera and Marquez C4636/54
Glucose in blood ← Insulin+Infection ↑
Cleempoel and Conard C3918/53
Glucose in blood ← Infection ↑
Cleempoel and Conard C3918/53
Glucose in blood ← Glucose
Frawley C6233/55
Glucose in blood ← Protein ↓
Goth et al C1145/54
Glucose in blood ← Fasting ↓
Gastaldi and Fedeli B99742/54
Glucose in urine ← Cortisol
Goldfien et al C3960/55
Glucose in urine ← Chlorocortisol
Goldfien et al C3960/55
Thorn et al C3653/55
Glucose in urine ← Fluorocortisol
Goldfien et al C3960/55
Renold et al. C6245/55
Thorn et al C3653/55
Glucose in urine ← Aldosterone
Thorn et al C6249/55
Glucose in urine ← 9α-fluorocorticosterone
Goldfien et al C6229/55
Glucose in urine ← Luteoids 11 hydroxy progesterone dihydroxy progesterone
Goldfien et al C6229/55
Glucose in urine ← 9α-fluoro-11β hydroxyprogesterone 9α fluorodihydroxyprogesterone
Goldfien et al. C6229/55
Ø Ketones in blood ← Protein
Goth et al C1145/54
↓ Ketones in blood ← Fasting
Gastaldi and Fedeli B99742/54
Nitrogen in urine ← 9α-fluorocortisol
Renold et al C6245/55
Nitrogen in urine ← Aldosterone
Mach and Fabre C3626/54
Protein in blood ← Muscular exercise Ø
Fimiani C5523/53
Amino acid in blood ← Gelatine
Pedrazzi C4952/55
Hexosamine in blood ← Infection ↑
Boas et al C5708/55
NH_3 in urine NPN in blood
Langeron et al C4699/54 (discussion)
Creatinine in urine ← Δ cortisone ↑ Δ cortisol ↑
Pechet C4043/55
Urea in urine ← Fasting
Gastaldi and Fedeli B99742/54
Uric acid in urine ← 9α-fluorocortisol
Renold et al. C6245/55

Potassium in urine ← Luteoids 11 hydroxyprogesterone dihydroxyprogesterone
Goldfien et al. C6229/55

Potassium in urine ← 9α-fluoro-11β hydroxyprogesterone 9α-fluoro-dihydroxyprogesterone
Goldfien et al. C6229/55

Potassium in urine ← Liquorice ↑
Menkyna C1707/53

Phosphorus in blood ← Cortisone+ Glucose+NaCl
Frawley C6218/55 C6233/55

Phosphorus in blood ← Glucose
Frawley C6233/55

Phosphorus in urine ← Aldosterone
Thorn et al C6249/55

Magnesium ← NaCl deficiency ↓
Hills et al C4059/55 (in urine)

Water balance ← DOCA
Gabriel et al C5354/55

Water balance ← Aldosterone
Mach and Fabre C5654/55
Prunty et al. B98213/54

Water balance ← Phenylbutazone
Gabriel et al C5354/55

Water in tissues ← Aldosterone
Soffer C5408/55

Diuresis
Langeron et al C3370/54
C4699/54 (discussion)

Diuresis ← Adrenalectomy+Cortisone+ Water load
Bergenstal et al C3657/55

Diuresis ← 9 fluorocortisol
Renold et al C6245/55

Diuresis ← Aldosterone
Prunty et al. B98213/54

Diuresis ← Aldosterone Ø+Water load
Soffer C5408/55

Diuresis ← Na salts
Membrives and Repetto C1120/54

Blood volume ← DOCA, phenylbutazone
Gabriel et al C5354/55

↑ ACTH in blood
Gemzell C2058/54
Moruzzi et al B98688/54
(activable fraction)

ACTH in blood ← Cortisone+DOCA
Parrott C3165/55

MTH in blood urine ← Cortisone
Shizume and Lerner C416/54

Corticoids in blood
Endroczi C4651/54

Corticoids in blood ← ACTH
Eik Nes et al B99412 C927/55
(17 hydroxycorticoids)

Corticoids in blood ← Cortisol (infusion)
Glenn et al. C1628/54

Corticoids in urine
Lenti et al C3320/54
Patrono et al B97935/54
(ste n quotient)

Corticoids in urine ← ACTH
de Gennes et al C1921/54
(reducing)
Jadresic et al C2313/54
(17 ketogenic steroids)
Piotti and Bonomi C1350/54
(17 hydroxycorticoids reducing corticoids)

Corticoids in urine ← ACTH+Pregnancy in man
Observations on two adrenal deficient women revealed that "near maximal stimulation with intravenous corticotrophin failed to elicit evidence of any consequential adrenal like response during pregnancy" (Hills et al. B99410/54) This would suggest that even if the placenta produces corticoids it does not respond to stimulation with ACTH Of course the demonstration of corticoids in placental extracts is also compatible with the view that the steroids are merely stored there and not actually secreted

Corticoids in urine ← Cortisone
Gray C6565/55 (cortisone cortisol, tetrahydrocortisone)

Corticoids in urine ← Cortisol (infusion)
Glenn et al. C1628/54

Corticoids in urine ← Cortisol
Gray C6565/55 (cortisone cortisol tetrahydrocortisone)

Corticoids in urine ← Cortisol+ Diurnal variations
Thorn C5435/55
(17 hydroxycorticoids)

Corticoids in urine ← Aldosterone ↑
Soffer C5408/55 (F Cs)

Corticoids in urine ← Pregnancy ↑
Hills et al B99410/54
(neutral reducing lipids G Cs)

Corticoids in urine ← Cafestrol Ø
Piotti C1853/54
(reducing steroids)

↓ Aldosterone in urine
Luetscher and Curtis C4073/55

Aldosterone in urine ← Aldosterone Ø
Mills B99042/54

↓ 17 KS in blood
Schwartz and Pivel B99621/54

17 KS in blood ← Cortisone ↑
Schwartz and Pivel B99621/54

17 KS in urine ← ACTH
de Gennes et al. C1921/54
Jadresic et al. C2313/54
Piotti and Bonomi C1350/54
Pond C5683/55 (fractions)

17 KS in urine ← ACTH+Pregnancy
Hills et al. B99410/54
17 KS in urine ← Cortisone
Pond C5683/55 (fractions)
17 KS in urine ← Aldosterone Ø
Soffer C5408/55
17 KS in urine ← Pregnancy ↑
Hills et al B99410/54
17 KS in urine ← Cafestrol ↑
Piotti C1853/54
17 KS in urine ← Infection ↑
Cleempoel and Conard C3918/53
α ketolic steroids in urine ← Cortisone
cortisol DOC desoxocortisone
cpd A cpd B
Richardson et al C1941/55
3 Ketosteroids in blood
Butt and Croke C904/53
Steroids in urine ← 21 desoxycortisol,
17 α hydroxyprogesterone
Rosselet et al B99407/54
↓ Uropepsin
Gray et al C1309/54 C4057/55
Ascorbic acid in blood ← Short waves ↓
Conti B98486/54
Ascorbic acid in blood ←
Pyrazolone derivatives ↓
Tomek C2811/55
Ascorbic acid in urine ← ACTH Ø
Beck et al B97413/54
Lactate in blood ← Cortisone+Glucose+
NaCl
Frawley C6218/55 C6233/55
Lactate in blood ← Glucose
Frawley C6233/55
Pyruvic acid in blood ← Cortisone+
Glucose+NaCl
Frawley C6218/55 C6233/55
Pyruvic acid in blood ← Cortisol (i v)
Frawley C6233/55
Pyruvic acid in blood ← Cortisol+
Fasting
Frawley C6218/55
Pyruvic acid in blood ← Glucose
Frawley C6233/55
Nerves
Brzezicki et al C5793/54 (EEG)
de Castro et al. C5796/54 (EEG)
Hemphill C6393/55
(psyche discussion)
Hermann C2436/54 (sympathicus
histology of ganglion cells)
Wallerstein et al. C3915/54
(psyche)
Nerves ← Cortisone
Gordan C6127/54
(convulsion brain damage)

Hypophysis
Casarini and Rossi C3796/53
(histology)
Ruhland C34/53
Wilson and Ezrin C5888/54
(PAS purple cells)
Pancreas (histology)
Sloper C5880/54
Eosinophils in blood ← ACTH
Cortes B97746/53
de Gennes et al. C1921/54
Jadresic et al. C2313/54
Eosinophils in blood ← ACTH+Pregnancy
Hills et al B99410/54
Eosinophils in blood ← Adrenaline Ø
Cortes B97746/53
Peixoto and Dias C3517/52
Eosinophils in blood ← Cortisone
Cortes B97746/53
Laidlaw et al. C5932/55
Eosinophils in blood ← Cortisone+DOCA
+Diurnal variations
Kaine et al C1534/55
Eosinophils in blood ← Cortisone+
Muscular exercise Ø
Conn C1134/54
Eosinophils in blood ← Cortisone+
Muscular exercise+Diurnal
variations
Kaine et al C1534/55
Eosinophils in blood ← Cortisol
Goldfien et al. C3960/55
Laidlaw et al C5932/55
Eosinophils in blood ← Chlorocortisol
Goldfien et al. C3960/55
Thorn et al C3653/55
Eosinophils in blood ← Fluorocortisol
Goldfien et al C3960/55
Renold et al C6245/55
Thorn et al C3653/55 C6249/55
Eosinophils in blood ← Aldosterone
Prunty et al B98213/54
Thorn et al C6249/55
Eosinophils in blood ← 9α-
fluorocorticosterone
Goldfien et al C6229/55
Thorn et al C6249/55
Eosinophils in blood ← Luteoids 11
hydroxyprogesterone dihydroxy
progesterone 9α fluoro-11β hydroxy
progesterone 9 fluorodihydroxy
progesterone
Goldfien et al C6229/55
Eosinophils in blood ← Pregnancy+
Diurnal variations Ø
Halberg and Kaiser B97577/54
Blood count ← Insulin
Noguera and Marquez C4656/54
(eosinophils lymphocytes)
Eosinophils in blood ←
Muscular exercise Ø
Fumani C5523/53

Eosinophils in blood ← Amidopyrin Ø
Baldini and Piccinelli
B96803/53
Eosinophils in blood ← Glucose Ø
Goth et al C3097/53
Eosinophils in blood ← Histamine ↓
Sicuteri and Zurlo C4029/54
Eosinophils in blood ← Leucine Ø
Góth et al C3097/53 C3488/55
Eosinophils in blood ← Phenylbutazone
Yrarrazaval and Atria C2205/54
Eosinophils in blood ← Fasting Ø
Gastaldi and Fedeli B93742/54
Eosinophils in blood ← Diurnal variations
Conn and Kaine C3469/54
Visscher and Halberg C3418/55
↓ Blood coagulation
Marrazza B98327/53
Blood pressure ← DOCA
Deltour C5415/55
Blood pressure ← Aldosterone
Mach and Fabre C3626/54
C3654/55 C4657/54
Prunty et al B98213/54
Soffer C5408/55
Kidney (function)
Langeron et al C3370/54 C4699/54
C4700/54 (discussion)
Kidney (function) ← Noradrenaline
Nickel et al C458/54
Kidney (function) ← Cortisol
Laidlaw et al C5932/55
Stomach secretion ← (Cortisone+DOCA) ↑
+Histamine
Stempien and Dagradi B99896/54
↓ Stomach secretion ← Histamine
Stempien and Dagradi B99896/54
Takata s test ← DOCA Ø
Pende C128/53
Joints ← Cortisone DOCA
van de Laan C4088/55
(flexion deformities)
Joints ← Cortisone+DOCA
Hursh C2857/55
Maranon and Pozuelo C3514/52
(reappearance of tuberculous arthritis)
Muscles ← ACTH ↑ ACE ↑ cortisone ↑
Kuchmeister C1864/54
(internal muscle pressure)
Muscles ← Cortisone ↓+DOCA
Bergenstal C5416/55 (stiffness)
Muscles ← DOCA ↑
Bergenstal C5416/55 (stiffness)
Kuchmeister C1864/53
(internal muscle pressure)
Muscles ← DOCA+Potassium Ø
Bergenstal C5416/55 (stiffness)
Muscles ← NaCl
Kuchmeister C1864/54
(internal muscle pressure)

Pigment in skin ← Aldosterone Ø
Soffer C5409/55
Thorn et al C6249/55
Pigment in skin ← Aldosterone ↓
Mach and Fabre C3626/53
C3654/55

ADRENOGENITAL SYNDROME

(Including Achard Thiers syndrome Wilkins syndrome congenital adrenal hyperplasia)

Adrenogenital Syndrome ← Various

Cortisone
Andreole B99891/54
Appel and Reinwein C6414/55
Decourt and Jayle B98065/53
Gilbert Dreyfus et al B99610/54
Pattee et al B98228/54
Cortisone+DOCA
Debre et al B99890/54
Cortisone+DOCA+NaCl
Ehrengut and Mossmer B96678/54
Humblet et al C3375/54
Cortisone+Ovariectomy
Plate B96557/54
Cortisone+Folliculoids
Armstrong C5365/55
Cortisone+Age
Wilkins et al C3659/55
Cortisone+Infection trauma
Segaloff C2665/55
Cortisol
Segaloff et al C4150/55
Cortisol+Infection trauma
Segaloff C2665/55
NaCl+Pantothenic acid
Ehrengut and Mossmer B96678/54

Adrenogenital Syndrome → Targets

↑ Glucose in blood ← Adrenaline
Ely et al C454/54
Glucose in blood ← Aldosterone ↑+
Glucose
Prunty et al B98213/54
Glucose in blood ← Insulin
Staehelin et al C4464/55
NaCl in urine ← Aldosterone ↓
Prunty et al. B98213/54
Cl in urine ← DOCA ↑
Ehrengut and Mossmer B96678/54
Ø Na/potassium ratio in saliva
Prader et al. C3655/55
Potassium balance ← Aldosterone
Prunty et al B98213/54
Water balance ← Aldosterone
Prunty et al B98213/54
Diuresis ← ACTH
Decourt and Jayle C1938/54

17 KS in urine ← ACTH+Pregnancy
Hills et al B99410/54
17 KS in urine ← Cortisone
Pond C5683/55 (fractions)
17 KS in urine ← Aldosterone Ø
Soffer C5408/55
17 KS in urine ← Pregnancy ↑
Hills et al B99410/54
17 KS in urine ← Cafestrol ↑
Piotti C1853/54
17 KS in urine ← Infection ↑
Cleempoel and Conard C3918/53
α ketolic steroids in urine ← Cortisone cortisol DOC desoxocortisone cpd *A* cpd *B*
Richardson et al C1941/55
3 Ketosteroids in blood
Butt and Croke C904/53
Steroids in urine ← 21 desoxycortisol, 17 α hydroxyprogesterone
Rosselet et al. B99407/54
↓ Uropepsin
Gray et al C1309/54 C4037/55
Ascorbic acid in blood ← Short waves ↓
Conti B98486/54
Ascorbic acid in blood ← Pyrazolone derivatives ↓
Tomek C2811/55
Ascorbic acid in urine ← ACTH Ø
Beck et al B97413/54
Lactate in blood ← Cortisone+Glucose+NaCl
Frawley C6218/55 C6233/55
Lactate in blood ← Glucose
Frawley C6233/55
Pyruvic acid in blood ← Cortisone+Glucose+NaCl
Frawley C6218/55 C6233/55
Pyruvic acid in blood ← Cortisol (i v)
Frawley C6233/55
Pyruvic acid in blood ← Cortisol+ Fasting
Frawley C6218/55
Pyruvic acid in blood ← Glucose
Frawley C6233/55
Nerves
Brzezicki et al C5793/54 (EEG)
de Castro et al *C5796/54 (EEG)*
Hemphill C6393/55 (psyche discussion)
Hermann C2436/54 (sympathicus histology of ganglion cells)
Wallerstein et al. C3915/54 (psyche)
Nerves ← Cortisone
Gordan C6127/54 (convulsion brain damage)

Hypophysis
Casarini and Rossi C3796/53 (histology)
Ruhland C34/53
Wilson and Ezrin C5888/54 (PAS purple cells)
Pancreas (histology)
Sloper C5880/54
Eosinophils in blood ← ACTH
Cortés B97746/53,
de Gennes et al. C1921/54
Jadresic et al. C2313/54
Eosinophils in blood ← ACTH+Pregnancy
Hills et al B99410/54
Eosinophils in blood ← Adrenaline Ø
Cortés B97746/53
Peixoto and Dias C3517/52
Eosinophils in blood ← Cortisone
Cortés B97746/53
Laidlaw et al. C5932/55
Eosinophils in blood ← Cortisone+DOCA +Diurnal variations
Kaine et al. C1534/55
Eosinophils in blood ← Cortisone+ Muscular exercise Ø
Conn C1134/54
Eosinophils in blood ← Cortisone+ *Muscular exercise+Diurnal* variations
Kaine et al C1534/55
Eosinophils in blood ← Cortisol
Goldfien et al. C3960/55
Laidlaw et al. C5932/55
Eosinophils in blood ← Chlorocortisol
Goldfien et al. C3960/55
Thorn et al C3653/55
Eosinophils in blood ← Fluorocortisol
Goldfien et al C3960/55
Renold et al C6245/55
Thorn et al C3653/55 C6249/55
Eosinophils in blood ← Aldosterone
Prunty et al B98213/54
Thorn et al C6249/55
Eosinophils in blood ← 9α fluorocorticosterone
Goldfien et al C6229/55
Thorn et al C6249/55
Eosinophils in blood ← Luteoids 11 hydroxyprogesterone dihydroxy progesterone 9α-fluoro-11β hydroxy progesterone 9α-fluorodihydroxy progesterone
Goldfien et al C6229/55
Eosinophils in blood ← Pregnancy+ Diurnal variations Ø
Halberg and Kaiser B97577/54
Blood count ← Insulin
Noguera and Marquez C4656/54 (eosinophils lymphocytes)
Eosinophils in blood ← Muscular exercise Ø
Fimiani C5523/53

Other Adrenal Diseases

Adenoma (pigmented) ← Stomach carcinoma
Luders C228/53

Adrenal cortical carcinoma ↑ → Temperature
Boyd et al B98199/52

Adrenal cortical carcinoma → Glucose in blood
Robinson and Baker Bates B97506/54

Adrenal cortical carcinoma → Corticoid metabolism (discussion)
Dorfman C907/54

Adrenal cortical carcinoma → Corticoids in adrenal venous blood
Buch C903/53 (cortisol, 11 hydroxyandrost-4 ene-3 17 dione)

Adrenal cortical carcinoma ↑ → Aldosterone in urine
Venning et al. C3644/55

Adrenal cortical carcinoma → 17 KS
de Courcy B98960/54 (fractions)

Adrenal cortical carcinoma → Steroids radioactive in urine ← Acetate radioactive cholesterol radioactive
Ungar and Dorfman C1[illegible]6/53

Adrenal cortical carcinoma → α ketolic steroids in urine
Dohan et al C2859/55

Adrenal cortical carcinoma ↑ → Leucocytes in blood
Robinson and Baker Bates B97506/54

Adrenal cortical carcinoma → Blood pressure
Robinson and Baker Bates B97506/54

Adrenal cortical tumor ← Adrenal cortical tumor extirpation + Cortisone
Bernheim et al C642/54

Adrenal cortical tumor → Urea in blood ← Adrenal cortical tumor extirpation
Wolfson et al C1400/55

Adrenal cortical tumor → Corticoids in urine ← ACTH
Mardy B98197/53 B98198/53

Adrenal cortical tumor → Corticoids in urine ← Adrenal cortical tumor extirpation
Wolfson et al C1400/55 (fractions)

Adrenal cortical tumor → 17 KS in urine
Ceresa B98777/53

Adrenal cortical tumor → 17 KS in urine ← ACTH
Mardy B98197/53 B98198/53

Adrenal cortical tumor → 17 KS in urine ← Adrenal cortical tumor extirpation
Wolfson et al. C1400/55

Adrenal cortical tumor → 17 KS in urine ← Cortisol Ø (i v)
Jailer and Wallace C6250/55
Segaloff et al. C1533/55

Adrenal cortical tumor → Pregnanediol in urine ← ACTH
Segaloff et al C1533/55

Adrenal cortical tumor → Pregnancy ← Adrenal cortical tumor extirpation
Kiefer et al C1399/55

Adrenal hemorrhage (in foetus or newborn) — Pathogenesis
Onnis C5496/54 (review)

Adrenal hemorrhage ← Vitamin K (to mother) ↓
Plum et al. C313/54 (incidence in newborn)

Adrenal hyperplasia
Segaloff C2311/54 (review)

Adrenal hyperplasia ↑ → LH in urine
Manaro et al C2207/54

Adrenal hyperplasia → 17 hydroxycorticoids in blood ← ACTH
Christy et al C5676/55

Adrenal hyperplasia → 17 KS
de Courcy B98960/54 (fractions)

Adrenal hyperplasia → 17 KS in urine ← ACTH ↑
Segaloff et al. C1533/55

Adrenal hyperplasia → 17 KS in urine ← Cortisol (i v) ↓
Segaloff et al C1533/55

Adrenal hyperplasia → 17 KS in urine ← 9 fluorocortisol
Renold et al. C6[illegible]45/55

Adrenal hyperplasia → Pregnanediol in urine ← ACTH ↑
Segaloff et al C1533/55

Adrenal hyperplasia → Pregnanediol in urine ← Cortisol (i v) ↓
Segaloff et al C1533/55

Adrenal hyperplasia → Δ androstene-3 17 dione in adrenals in man
Block et al C2487/55

Adrenal hyperplasia → 3α 17α dihydroxy allopregnane-20-one in urine
Fukushima et al C76/54

Adrenal hyperplasia → Joints ← Adrenalectomy (partial)
Perkoff et al C2485/55

Adrenal hyperplasia → Pigment in skin ← Adrenalectomy (partial) ↑
Hernberg B99592/54

Adrenal virilism → Pregnanetriol in urine ← ACTH ↑
Brooks C3241/55

Adrenal virilism → Pregnanetriol in urine ← Cortisone ↓
Brooks C3241/55

↑ ACTH in blood
Bierich et al. C4463/55
Cemzell C2058/54
Corticoid metabolism (discussion)
Dorfman C907/54
↓ 17 hydroxycorticoids in blood
Ely et al C454/54
17 hydroxycorticoids in blood ← ACTH Ø
adrenaline Ø
Ely et al C454/54
17 hydroxycorticoids in blood ←
Cortisone withdrawal
Migeon C3641/55
17 hydroxycorticoids in urine ←
Aldosterone Ø
Prunty et al B98213/54
17 hydroxycorticoids in blood ← Insulin
Staehelin et al C4464/55
Corticoids in urine ← ACTH
Bierich et al C4463/55
Decourt and Jayle C1938/54
(tetrahydrocortisone)
Jailer B97028/53
Corticoids in urine ← Cortisone Ø
Pattee et al B98228/54 (F Cs)
Corticoids in urine ← Cortisone withdrawal
Hansted et al C5993/55
Corticoids in urine ← Cortisone ↑+
Ovariectomy
Plate B96557/54 (reducing)
17 hydroxycorticoids in urine ← Insulin
Staehelin et al C4464/55
Aldosterone in urine
Luetscher and Curtis C4073/55
Aldosterone in urine ← Aldosterone ↑
Mills B99042/54
17 KS in blood ← Cortisone withdrawal
Migeon C3641/55 (fractions)
17 KS in urine
Decourt and Jayle C2243/54
(fractions)
17 KS in urine ← ACTH
Bierich et al C4463/55
Decourt and Jayle C1938/54
Groen et al C4465/55 (fractions)
17 KS in urine ← ACTH ↑+Cortisone
Querido C5427/55
17 KS in urine ← Cortisone
Andreoli B99891/54
Ehrengut and Mossmer B96678/54
Groen et al C4465/55 (fractions)
Pattee et al B98228/54
17 KS in urine ← Cortisone ↓
Querido C5427/55
Taylor and Snow B97851/54
17 KS in urine ← Cortisone withdrawal
Hansted et al C5993/55
17 KS in urine ← Cortisone+Ovariectomy
Plate B96557/54
17 KS in urine ← Cortisone+Folliculoids
Armstrong C5365/55
17 KS in urine ← Cortisone+Age
Wilkins et al. C3659/55
17 KS in urine ← Cortisone+Hypertension
Decourt et al C334/53
17 KS in urine ← Cortisol ↓ (iv)
Jailer and Wallace C6230/55
17 KS in urine ← Fluorocortisol ↓
Goldfien et al C3960/55
17 KS in urine ← Aldosterone Ø
Prunty et al B98213/54
17 KS in urine ← Pantothenic acid Ø
Ehrengut and Mossmer B96678/54
Steroids in urine (α steroids β steroids)
Decourt and Jayle C2243/54
Folliculoids in urine ← ACTH
Decourt and Jayle C1938/54
Pregnanediol in urine
Decourt and Jayle C2244/54
Pregnanetriol in urine ← ACTH+Age
Wilkins et al C3659/55
Pregnanetriol in urine ← Cortisone
Rumney C5403/55
Pregnanetriol in urine ← Cortisone+Age
Wilkins et al C3659/55
3α 17 20α pregnanetriol 11 one in
urine ← Cortisone ↓+Sex (♀)
Zondek and Finkelstein C819/54
Ø Uropepsin
Gray et al C1309/54
Psyche
Hemphill C6393/55 (discussion)
Zublin B97029/53 (maturation)
Pregnancy
Vesell C6553/54
Testis ← Cortisone+Age
Wilkins et al C3659/55
(size histology)
Eosinophils in blood ← ACTH
Bergstrand C4458/55
Bierich et al C4463/55
Ely et al C454/54
Jailer B97028/53
Eosinophils in blood ← Adrenaline
Ely et al C454/54
Eosinophils in blood ← Cortisone
Bierich et al C4463/55
Eosinophils in blood ← Aldosterone Ø
Prunty et al B98213/54
Eosinophils in blood ← Insulin
Bierich et al C4463/55
Staehelin et al C4464/55
Eosinophils in blood ← Fasting
Bierich et al C4463/55
Blood pressure ← Cortisone+Age
Wilkins et al C3659/55
Blood pressure ← Cortisone+Hypertension
Decourt et al C334/53
Blood pressure ← Aldosterone Ø
Prunty et al B98213/54
Growth ← Cortisone+Age
Wilkins et al C3659/55

GTH+Adrenalectomy ↓ in rat
Mandl C285/54 (weight)
GTH+Adrenalectomy+Corticoids in rat
Mandl C285/54 (*histology*)
GTH+Adrenalectomy+Cortisone ↑ in rat
Mandl C285/54 (weight)
GTH+Adrenalectomy+Cortisone ↑ cortisol ↑ +Age (immature) in rat
Smith C4485/55
(hyperemia response)
GTH+Adrenalectomy+DOCA Ø in rat
Mandl C285/54 (weight)
GTH+Adrenalectomy ↓+Age (immature) in rat
Smith C4485/55
(hyperemia response)
GTH+Cortisone ↓ cortisol ↓+Age (immature) in rat
Smith C4485/55
(hyperemia response)
GTH ↑+Fasting in fowl
Hosoda et al. C4557/55 (weight)
Adrenalectomy ↓ in rat
Mandl C285/54 (weight)
Adrenalectomy+Cortisol+DOCA+MAD in rat
Selye C1140/55 C2007/55
(weight, histology)
Adrenalectomy+Cortisol+MAD in rat
Selye C2007/55 (weight)
Adrenaline ↑ in rat
Badrick et al. C4501/55
(phosphorus radioactive)
Cortisone in guinea pig
Businco B99102/54 (histology)
Iglesias and *Mardones* C2255/54
(ovarian tumor—transplanted)
Cortisone in *rabbit*
Bracali and Spigolon C11/54
C2017/53 (histology)
Businco B99102/54 (histology)
Schmid Bircher B99368/54 (weight)
Cortisone in rat
Blivaiss et al. C1602/54
(weight histology)
Hoch Ligeti and Irvine *C433/54*
(weight)
Iglesias C4167/54 (ovarian tumor—transplanted)
Cortisone ↑+Age (immature) in rat
Blivaiss et al B98138/54
(weight number of follicles)
Cortisol in rat
Hoch Ligeti and Irvine C433/54
(weight)
DOCA
Mardones et al B97506/52
(antiluteinizing effect)
DOCA in fish
Egami C4212/55 (testis ova)
DOCA, in rat
Iglesias C4167/54
(ovarian tumor—transplanted)

DOCA in guinea pig
Iglesias and Mardones *C2255/54*
(ovarian tumor—transplanted)
DOCA in rat
Hoch Ligeti and Irvine C433/54
(weight)
DOCA+Folliculoids in fish
Egami C4212/55 (testis-ova)
DOCA ↑+Folliculoids in rat
Conti B98675/54 (weight)
DOCA+Season, in fish
Egami C2174/54
(weight, histology)
Folliculoids ↓ in rat
Conti B98675/54 (weight)
Folliculoids+Age (larval) in frog
Chang and Witschi C4490/55
(histology)
Testoids in rat
Iglesias *C4167/54*
(ovarian tumor—transplanted)
Testoids+Age (larval) in frog
Chang and Witschi C4490/55
(histology)
MAD in rat
Selye C1140/55 (weight, histology)
Pinealectomy ↑ in rat
Thieblot C1151/54 (weight)
Pinealectomy ↑+Age (immature) in rat
Thieblot B98670/54 (weight)
Pineal extract, in rat
Thieblot C1151/54
(histology of transplant)
Thymectomy Ø in rat
Ogawa and Itagaki *B98640/54*
(phosphorus radioactive)
Shibata et al B97619/52 (weight)
Thymus extract, lymph node extract, liver extract, in rat
Matteini and Marabini B99837/53
(weight)
Tuberculosis+Antibiotic, isonicotinic acid hydrazide PAS thiosemicarbazone, in guinea pig
Chiti and Astengo B99730/54
(ascorbic acid)
Trauma in rat
Hoch Ligeti and Irvine C433/54
(weight)
Mandl C285/54 (*weight*)
Cold+Muscular exercise in rat
Badrick et al. C4501/55
(*phosphorus radioactive*)
ABA+Anesthetic (ether nembutal)+ *Histamine (intraventricularly)* in rabbit
Sawyer C2466/55 (ovulation)
Anesthetic (*ether nembutal*)+Histamine (intraventricularly) in rabbit
Sawyer C2466/55 (ovulation)
Fasting ↓ in fowl
Hosoda et al. C4557/55 (weight)

Aldosteronism (primary—Conn)
Anonymous C5706/55 (review)
Conn C2804/55
Llaurado C6057/55 (discussion)
Apert s syndrome (pilar virilism) → Kidney (function)
Langeron et al C5734/54
Asthenia with pigmentation → Corticoids 17 KS in urine ← ACTH
de Gennes et al C1921/54
Asthenia with pigmentation → Blood count ← ACTH
de Gennes et al C1921/54 (eosinophils)
Bongiovanni Eisenmenger syndrome ← DOCA + Hepatic cirrhosis
Ernould C1225/53
Dissociated adrenal insufficiency → Eosinophils protein in blood ← Muscular exercise Ø
Fimiani C5523/53
Hypercorticoidism
Benard et al B96806/53 (review)
Bouhuys C3919/54 (review)
Forsham and Reyes B97307/54 (review)
Hypercorticoidism → 11 oxysteroids in urine ← ACTH
Klotz C3365/54
Hypercorticoidism → Aldosterone in urine
Luetscher and Curtis C4073/55
Hypercorticoidism → 17 KS in urine ← ACTH
Klotz C3365/54
Hypercorticoidism → Hypophysis
Casarini and Rossi C3796/53 (histology)
Hypermineralocorticoidism → 17 KS in urine
Earle et al C3499/51
Adrenal myelolipoma
Biressi C2441/54
Phaeochromocytoma → BMR ← Adrenaline
Horstmann B97578/54
Phaeochromocytoma ↑ → Fibrinolytic action of plasma
Crifoni and Vanacore C2544/54
Phaeochromocytoma → Hypophysis (histology)
Ferraris et al C226/54
Phaeochromocytoma ↓ → Thrombocytes in blood
Crifoni and Vanacore C2544/54
Phaeochromocytoma ↓ → Thymus (weight)
Propst C4309/54
Phaeochromocytoma → Kidney (vessels)
Pirkle C1034/54

OVARIES

Review
Cruz C3555/55 (physiology)

Ovaries ← Various

Hypothalamus lesion in cat
Laqueur C6115/54 (histology)
Laqueur et al C6334/55 (histology)
Hypophysectomy in fowl
Frantz C3798/54 (weight histology)
Hypophysectomy + ACTH ↑ + GTH + Age (immature) in rat
Smith C4485/55 (hyperemia response)
Hypophysectomy + STH + Folic acid vitamin B_1 in rat
Penhos and Foglia C6746/54 (weight)
Hypophysectomy ↓ + GTH + Age (immature) in rat
Smith C4485/55 (hyperemia response)
Hypophysectomy + Adrenaline in rat
Badrick et al C4501/55 (phosphorus radioactive)
Hypophysectomy + Folliculoids testoids + Age (larval) in frog
Chang and Witschi C4490/55 (histology)
Hypophysectomy + Cold + Muscular exercise in rat
Badrick et al C4501/55 (phosphorus radioactive)
Hypophyseal stalk section in rabbit
Harris C3662/55 (weight)
ACTH in rat
Hoch Ligeti and Irvine C433/54 (weight)
Papadia C1352/54 (histology connective tissue)
ACTH + STH DOCA in rat
Selye C2007/55 (weight)
ACTH + Folliculoids in rabbit
Brocq and Stora C5946/55 (weight)
ACTH Ø + Pregnancy in monkey
Schmidt and Hoffmann B96565/54
ACTH ↓ + Pregnancy in rat
Tarantino and Cassano B99678/54 (ascorbic acid)
ACTH (to mother) Ø + Pregnancy + Age (foetal) in monkey
Schmidt and Hoffman B96565/54
ACTH + Testoids MAD methyl testosterone in rat
Selye C2007/55 (weight)
STH ↓ in guinea pig
Lanzza et al B99367/53 (histology function)
STH ↓ in rat
Conti B98675/54 (weight)
Hoch Ligeti and Irvine C433/54 (weight)
Matteini and Giusti B98288/53 (weight)

ACTH ↓+Ovariectomy+Folliculoids
in mouse
Flux B98952/54 (growth)
STH ↑ in cattle
Shaw C4984/55 (lactation)
Shaw et al C2766/55 (lactation)
STH in cattle and goat
Folley C4256/55 (lactation)
STH ↑ in goat
Meites C4985/55 (milk secretion)
STH+LTH+Ovariectomy+Folliculoids+
Luteoids in rabbit
Meites C4985/55 (milk secretion)
STH ↑+TTH in cattle
Wrenn and Sykes B98367/53
(lactation)
STH ↑+Thyroid extract withdrawal
in goat
Meites C4985/55 (milk secretion)
STH+Fasting in cattle
Shaw et al C2766/55 (lactation)
TTH in cattle
Shaw C4984/55 (milk secretion)
Wrenn and Sykes B98367/53
(lactation)
Hypophyseal posterior lobe hormones
Noble C1148/54
(lactation–discussion)
Oxytocin+Adrenalectomy+Adrenaline
in rabbit
Cross C1792/55 (milk ejection)
Oxytocin+Adrenaline ↓ in rabbit
Cross B98962/54 (milk ejection)
Oxytocin+Adrenaline+Anesthetic
in rabbit
Cross C1793/55 (milk ejection)
Oxytocin+Adrenal nerve stimulation ↓
in rabbit
Cross B98962/54 (milk ejection)
Oxytocin+Nerves (emotions faradic
shock) in rabbit
Cross C1793/55 (milk ejection)
Oxytocin+Anesthetic in rabbit
Cross C1793/55 (milk ejection)
Adrenalectomy ↓ in rat
Cowie and Tindal C4494/55
(lactation)
Flux C1796/55 (lactation)
Willig and Schrimpf C978/54
(lactation)
Adrenalectomy+Cortisone ↑ +
Ovariectomy in rat
Flux C1796/55 (lactation)
Adrenalectomy+DOCA ↑+Ovariectomy
in rat
Flux C1796/55 (lactation)
Adrenalectomy+Cortisol ↑ chlorocortisol ↑
fluorocortisol ↑ in rat
Cowie and Tindal C4494/55
(lactation)
Adrenalectomy+Aldosterone ↑ in rat
Cowie and Tindal C4494/55
(lactation)
Adrenalectomy+11 desoxysteroids
(various) in rat
Flux C1796/55 (lactation)
Adrenalectomy+Desoxocortisone ↑+
Ovariectomy in rat
Flux C1796/55 (lactation)
Adrenalectomy+Ovariectomy ↓ in rat
Flux C1796/55 (lactation)
Adrenalectomy+Ovariectomy+
Progesterone ↑ in rat
Flux C1796/55 (lactation)
Adrenal hormones
Noble C1148/54
(lactation–discussion)
Noradrenaline in rabbit
Cross C1792/55 (milk ejection)
Cortisone Ø+Ovariectomy in mouse
Flux B98952/54 (growth)
Cortisone ↓+Ovariectomy+Folliculoids
in mouse
Flux B98952/54 (growth)
Cortisol in cattle
Shaw C4984/55 (milk secretion)
Cortisol ↓+Ovariectomy+Folliculoids
in mouse
Flux B98952/54 (growth)
DOCA+Ovariectomy in mouse
Flux B98952/54 (growth)
DOCA+Folliculoids in mouse
Flux B98952/54 (growth)
Desoxocortisone Ø+Ovariectomy in mouse
Flux B98952/54 (growth)
Desoxocortisone ↓+Ovariectomy+
Folliculoids in mouse
Flux B98952/54 (growth)
Cpd A ↓+Ovariectomy+Folliculoids
in mouse
Flux B98952/54 (growth)
Ovariectomy+Folliculoids+Luteoids
in rat
Kirkham and Turner B99660/54
Trauma (extirpation of uterus and
annexes) ↓ in man
Hecht Lucari B98678/54
(secretion)
Digitalis in man
Olmer et al C4689/54
Exudate (locally) in rabbit
Menkin C4594/55

Uterus

Uterus ← Various

Hypophysectomy+STH+Folic acid
vitamin B_1 in rat
Penhos and Foglia C6746/54
Hypophysectomy+Adrenaline+Cerebro
spinal fluid in guinea pig
Gavrilova B97989/53 (contraction)
Hypophysectomy+Gonadectomy in rat
Hertz C2249/54

Starvation in man
Paullada C5443/55 (histology)
Zubirán et al C3157/54 (histology)

Ovarian Diseases

Acyclic menstrual bleeding–Pathogenesis (hypophysis)
Green et al C1816/55
Acyclic menstrual bleeding → 17 KS in urine ← Erythrocytosis
Green et al C1816/55
Amenorrhea–Pathogenesis
de Alvarez B98581/54 (adrenals)
Djurisic B99192/54 (G-A S)
Hyperfolliculoidism
Maurizio and Pasetto C1886/54 *(review)*
Hyperfolliculoidism–Pathogenesis
Fiaschi et al C6276/54 (review)
Maurizio and Pasetto C1886/54 (adrenals)
Hyperfolliculoidism → Na balance ← Na
de Paiva C2266/54
Hyperfolliculoidism → Corticoids in urine
de Paiva C2266/54 (chemical)
Zacco C1888/54 (chemical)
Hyperfolliculoidism → 17 KS in urine
Zacco C1888/54
Hyperfolliculoidism → Adrenals (function)
Quinet and Schermann C994/54 (discussion)
Infertility → Glucose Na potassium in urine ← 9α fluorocortisol
Renold et al C6245/55
Masculinovoblastoma ← Adrenalectomy (partial)
Hallett and Holler B96931/53
Menopause → Vagina ← ACTH
Nacci and Centonze B99992/53
Ovarian agenesis Ø → 17 hydroxycorticoids in blood ← ACTH
Eik Nes et al C927/55
Ovarian agenesis → Growth bones ← Methyltestosterone
Hellinga C4466/55
Ovarian insufficiency (secondary) → TTH in blood corticoids in urine
Fromm et al C5994/55
Ovarian insufficiency (secondary) → Adrenals (weight)
Fromm et al C5994/55
Ovarian insufficiency (secondary) → Eosinophils in blood ← Adrenaline
Fromm et al C5994/55
Precocious puberty → 3 β steroids in urine
Lelong et al C5577/54
Premature pubarche → Corticoids 17 KS in urine
Thamdrup C4474/55
Pseudohermaphroditism → ACTH in blood
Parrott C3165/55
Various ovarian diseases ← ACTH and/or cortisone
Schermann C4435/55 (discussion)

FEMALE ACCESSORY SEX ORGANS

(Including the sexual cycle pregnancy and lactation)

Mammary Glands

(Including lactation)

Lactation
Anonymous C6494/55 (review)
Hecht Lucari B98678/54 (role of hypophysis eosinophils)

Mammary Glands ← Various

Nerves
Noble C1148/54 (lactation–discussion)
Sympathicus stimulation + Oxytocin in rabbit
Cross C1792/55 (milk ejection)
Hypothalamus stimulation + Oxytocin in rabbit
Cross B98962/54 (milk ejection)
Hypothalamus stimulation + Oxytocin + Adrenalectomy in rabbit
Cross B98962/54 C1792/55 (milk ejection)
Hypothalamus stimulation + Adrenalectomy in rabbit
Cross C1792/55 (milk ejection)
Hypophysectomy ↓ in rat
Willig and Schrimpf C973/54 *(lactation)*
Hypophysectomy + STH + Cortisol + Ovariectomy + Folliculoids + Luteoids + Placenta extract in rat
Ray et al C3558/55
Hypophysectomy + Ovariectomy + Folliculoids + Luteoids in rat
Kirkham and Turner B99660/54
Hypophyseal anterior lobe extract + Folliculoids luteoids + Age (immature) in mouse
Flux B98951/54
Hypophyseal anterior lobe hormones
Nelson C1150/54 (review)
Noble C1148/54 (lactation–discussion)
ACTH in cattle
Shaw C4984/55 (milk secretion)
ACTH + STH in cattle
Shaw et al C2766/55 (lactation)
ACTH Ø + Ovariectomy in mouse
Flux B98952/54 (growth)

Oviduct ← Cortisone+Folliculoids
in monkey
Courrier C2158/54
Oviduct ← DOCA+Folliculoids
in monkey
Courrier C2158/54
Papillary process ← DOCA+Testoids
in fish
Egami C4214/54
Pregnancy ← Hypophysectomy in monkey
Smith B99018/54 C2760/50
Pregnancy ← Hypophysectomy in rat
Willig and Schrimpf C973/54
Pregnancy ← Hypophyseal anterior lobe
extract (STH)+Alloxan in rat
Nixon C42/54
Pregnancy ← *ACTH+GTH* in rat
Lax B96959/54
(detachment of placenta)
Pregnancy ← Adrenalectomy+Cortisone
cortisol DOCA in rat
Cupps C6328/55
Pregnancy ← GTH in rat
Lax B96959/54
(detachment of placenta)
Pregnancy ← Adrenalectomy in rat
Cassano and Tarantino C4674/54
Willig and Schrimpf C973/54
Pregnancy ← Cortisone in rabbit
Hoet B99981/53
Pregnancy ← DOCA in mouse
Burdick et al B98702/54
Pregnancy ← DOCA withdrawal ↑
in mouse
Burdick et al B98702/54 (abortion)
Pregnancy ← Cold ↓ in rat
Courrier and Marois C1929/54
(nidation body weight of foetus)
Pregnancy ← Rauwolfia alkaloids in rat
Gaunt et al B97572/54 (conception
rate)
Preputial gland ← Hypophysectomy+
Cortisone cortisol desoxocortisone
cpd A cpd B steroids (various)
in rat
Huggins et al C6332/55
Preputial gland ← ACTH+STH DOCA
testoids MAD methyltestosterone
in rat
Selye C2007/55
Preputial gland ← ACTH+KCl+
Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
Preputial gland ← STH+Adrenalectomy+
Cortisol+DOCA+Ovariectomy
in rat
Selye and Bois C1718/55
Preputial gland ← STH ↑+Folliculoids
in rat
Conti B98675/54 (weight)
Preputial gland ← STH ↑+Protein
deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
Preputial gland ← Adrenalectomy+
Cortisol+DOCA+MAD in rat
Selye C2007/55
Preputial gland ← Adrenalectomy+
Cortisol+MAD in rat
Selye C2007/55
Preputial gland ← Adrenalectomy+
Ovariectomy in rat
Huggins et al. C6332/55
Preputial gland ← DOCA ↑+Folliculoids
in rat
Conti B98675/54 (weight)
Preputial gland ← Folliculoids ↓ in rat
Conti B98675/54 (weight)
Vagina (estrus) ← Hypophysectomy+
ACTH GTH+Adrenal tumor
extirpation+Ovariectomy in rat
Houssay et al C2229/54
Vagina ← Hypophysectomy+Steroids
(various) in rat
Huggins et al C6551/54
Vagina ← ACTH+Ovariectomy in rat
Quaini and Durando B98362/53
Rossi B99685/54
Vagina ← GTH+Adrenalectomy Ø in rat
Mandl C285/54
(opening of closure membrane)
Vagina ← GTH+Adrenalectomy+
Corticoids in rat
Mandl C285/54
Vagina ← GTH+Ovariectomy in rat
Arzac C6647/55
Vagina ← Adrenalectomy+Ovariectomy
in man
Forsham C5422/55
Scowen C5423/55
Vagina ← Adrenalectomy (partial)
+Ovariectomy in mouse
Martinez and Bittner C4591/55
(smear)
Vagina ← Noradrenaline in rat
Eschbach B96929/53
Vagina ← Cortisone in rat
Blivaiss et al. C1602/54
(opening weight histology)
Vagina ← Cortisone+Folliculoids
in monkey
Courrier C2158/54
Vagina ← Cortisone ↑+Age (immature)
in rat
Blivaiss et al B98138/54
(time of opening)
Vagina ← Cortisone+Antibiotic
in cattle
LaGrange C3528/55
(inflammation after eversion)
Vagina ← DOC+Ovariectomy+
Allenolic acid in rabbit and rat
Courrier and Horeau C2156/54

Hypophysectomy+Steroids (various)
in rat
Huggins et al C6332/55 C6551/55
Hypophysectomy+Acetylcholine+
Cerebrospinal fluid in guinea pig
Gavrilova B97909/53 (contraction)
Hypophyseal stalk section in rabbit
Harris C3662/55
ACTH in rat
Papadia C1352/54
(histology connective tissue)
ACTH+Adrenalectomy+Ovariectomy+
Luteoids in rat
Hisaw and Velardo C6292/55
(experimental deciduoma formation)
ACTH+Ovariectomy in rat
Papadia C1352/54
(histology connective tissue)
Quaini and Durando B98362/53
(weight)
Rossi B99685/54
ACTH Ø+Ovariectomy+Folliculoids
in mouse
Flux B98952/54 (weight)
ACTH+Histamine in rat
Prassoli C1425/54 (histology)
STH ↓ in rat
Matteini and Giusti B98288/53
(weight)
CTH+Adrenalectomy+Cortisone in rat
Mandl C285/54 (weight)
CTH+Cortisone ↓+Age (immature)
in rat
Mandl C285/54 (weight)
GTH+Ovariectomy in mouse
Runner and Dickie C4407/55
GTH+Ovariectomy in rat
Arzac C6647/55
Adrenalectomy Ø+Gonadectomy in rat
Hertz C2249/54
Adrenalectomy+Ovariectomy+Folliculoids+Thyroidectomy in rat
Brogi C1575/54 (water in uterus)
Adrenalectomy+Ovariectomy+Luteoids
in rat
Hisaw and Velardo C6292/55
(experimental deciduoma formation)
Adrenaline+Cerebrospinal fluid ↑
in guinea pig
Gavrilova B97989/53 (contraction)
Noradrenaline in rabbit
Cross C1792/55 (milk ejection)
Cortisone in baboon
Marois et al C2109/54
Cortisone ↑ in rat
Bhivaiss et al C1602/54
(weight, histology)
Cortisone Ø+Gonadectomy in rat
Hertz C2249/54
Cortisone (locally) Ø+Ovariectomy
in mouse
Forbes B99026/54
(Hooker and Forbes test)

Cortisone+*Folliculoids*
Mardones et al B97553/52 (weight
as indicator of induced fibroma)
Cortisone+Folliculoids in monkey
Courrier C2158/54
Cortisone ↓+Age (immature) in mouse
Allen B97852/54 (weight)
Cortisone ↑+Age (immature) in rat
Bhivaiss et al B98138/54 (weight)
Cortisone+Histamine in rat
Prassoli C1425/54 (histology)
Cortisol (locally) Ø+Ovariectomy
in mouse
Forbes B99026/54
(Hooker and Forbes test)
DOC+Ovariectomy+Allenolic acid
in rabbit and rat
Courrier and Horeau C2156/54
DOCA in baboon
Marois et al C2109/54
DOCA+Ovariectomy in monkey
Krohn C1797/55
DOCA+Ovariectomy in mouse
Flux B98952/54 (weight)
DOCA+Folliculoids in monkey
Courrier C2158/54
DOCA+Histamine in rat
Prassoli C1425/54 (histology)
DOC allenolate+Ovariectomy in rabbit
Courrier C776/54
Courrier and Horeau C2156/54
DOC allenolate+Ovariectomy in rat
Courrier and Horeau C2156/54
Desoxocortisone ↑+Ovariectomy in mouse
Flux B98952/54 (weight)
Gonadectomy+Starvation in rat
Hertz C2249/54
Ovariectomy+Folliculoids in mouse
Runner and Dickie C4407/55
Ovariectomy+Folliculoids in rat
Arzac C6647/55
Ovariectomy+Folliculoids ↑+
Tuberculosis
Siems and Kracht C3183/54
(development of tuberculosis)
Nerves (emotions) ↓+Water load in dog
Abrahams and Pickford C2330/54
(contraction)
Acetylcholine+Cerebrospinal fluid ↑
in guinea pig
Gavrilova B97989/53 (contraction)
Cerebrospinal fluid in guinea pig
Gavrilova B97989/53 (contraction)

OTHER FEMALE ACCESSORY SEX ORGANS, THE SEXUAL CYCLE AND PREGNANCY

← Various

Menstruation ← Insulin (shock) in man
Michael C1762/54
Menstruation ← *Nerves (fear)*
Djurisic B99192/54

Postpartum hemorrhage Ø → Corticoids
in urine
Schneeberg et al B97972/53
Postpartum hemorrhage ↓ → 17 KS
in urine
Schneeberg et al B97972/53
Stillbirth (erythroblastosis foetalis)
← ACTH and/or cortisone
Allen et al C670/54

TESTIS AND MALE ACCESSORY SEX ORGANS

Testis ← Stimuli

Hypophysectomy ↓ in rat
Tobias et al B97093/54 (weight)
Hypophysectomy + LAP + ACTH + DOCA
+ Nephrectomy (partial) + NaCl
in rat
Salgado B99121/54 C1002/54
(weight)
Hypophysectomy + ACTH + STH +
Nephrectomy (partial) + NaCl
in rat
Salgado C1002/54 (weight)
Hypophysectomy + STH in fish
Pickford B97426/54 (weight)
Hypophysectomy + STH in rat
Cavallero and Pellegrini C1449/53
(weight)
Hypophysectomy + STH + DOCA +
Thyroxin + Nephrectomy (partial)
+ NaCl in rat
Salgado B99121/54 C1002/54
(weight)
Hypophysectomy + Adrenaline in toad
Houssay and Burgos C6549/54
(spermiation)
Hypophysectomy + Cortisone ↑ in rat
Greenberg and Aterman B99025/54
(weight/body weight)
Hypophysectomy + DOCA + Nephrectomy
(partial) + NaCl in rat
Salgado B99121/54
C1002/54 (weight)
Hypophysectomy + Folliculoids testoids +
Age (larval) in frog
Chang and Witschi C4490/55
(histology)
Hypophysectomy + Thyroxin Ø in rat
Scow B97432/54 (weight)
Hypophysectomy + Carcinogen in rat
Richardson et al C2406/53
(weight histology)
Hypophysectomy + Drugs
(SC 4473 SC 3402) in rat
Sturtevant C2757/55 (weight)
Hypophysectomy ↓ + Vitamin B_1 deficiency
in rat
de Caro et al B90993/54 (weight)

Hypophyseal irradiation (ultrasonic)
in guinea pig
Cicardo et al B97563/53
(histological changes)
Hypophyseal irradiation (deuterons) ↓
in rat
Tobias et al B97093/54 (weight)
ACTH
Yamamoto B98631/53 (electric
potential of homogenate)
ACTH in rat
Ores and Abelin C604/54
(creatine)
Soulairac et al C6445/55
(histology)
ACTH + STH + Nephrectomy (partial) +
NaCl in rat
Salgado C1002/54 (weight)
ACTH + Diseases (various) in man
Burt and Velardo B97411/54
(spermatogenesis)
ACTH + Casein + Potassium chloride +
Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
ACTH + Potassium chloride +
Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
STH in guinea pig
Larizza et al B99367/53
(histology function)
STH in rat
Matteini and Marabini B99837/53
(weight)
STH + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
STH + Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
FSH + Folliculoids + Sex (♂) in rat
Perry C6286/55 (histology)
Adrenalectomy + Adrenaline in toad
Houssay and Burgos C6549/54
(spermiation)
Adrenalectomy + Cortisone in rat
Fraile C4666/53 (weight)
Adrenalectomy + Cortisone + Testis
extirpation in rat
Tremolieres et al C1924/54
(weight)
Adrenalectomy + Lithospermum in rat
Slusher B98713/54
(weight ascorbic acid)
Adrenaline ↑ in frog
Vaglio B98557/53 (spermiation)
Adrenaline in toad
Houssay and Burgos C6549/54
(spermiation)
(Adrenaline + Vitamin B_1) Ø in rat
Fekete and Prokai C3200/54
(weight)

Vagina ← DOCA+Ovariectomy in man
Ruiz B99870/53
Vagina ← DOCA+Folliculoids
in monkey
Courrier C2158/54
Vagina ← DOC allenolate+Ovariectomy
in rabbit and rat
Courrier and Horeau C2156/54
Vagina ← Ovariectomy+Folliculoids
in rat
Arzac C6647/55
Various accessory organs ← Hypophysectomy
+Folliculoids testoids+Age
(larval) in frog
Chang and Witschi C4490/55
Various accessory organs ← Folliculoids+
Age (larval) in frog
Chang and Witschi C4490/55
Various accessory organs ← Testoids+
Age (larval) in frog
Chang and Witschi C4490/55

PREGNANCY DISEASES

Pregnancy Toxemias

Pathogenesis
Anonymous C563/54 (adrenals)
Garon B97231/54
(hypophysis adrenals)
Kushima B97690/53
(hypophysis hypothalamus)
Page and Glendening C5444/55
(review)
Schuurmans C6263/55
(adrenals serologic reactions)
Seitz B99852/54 (G A S)
Seliger C236/54 (G A S)
Sophian B97238/54 (renal ischemia)
C2444/55 (various)
Ulyssides et al B96958/54 (G A S)

Pregnancy Toxemias ← Various

GTH+ACE
Seliger C236/54
DOCA+NaCl+Water load
de Alvarez C6047/55
(pre eclampsia)
Hibernation (artificial)
Ligeaud et al B97443/54
ABA
Cohen B97722/53 (apresoline)
Mitra and Gupta C6685/55
(chlorpromazine)
Na salts Water load
de Alvarez C6047 55
(pre eclampsia)
Water load
de Alvarez C6047/55
(pre eclampsia)
Na deficiency
Anonymous C1035/54 (discussion)

Pregnancy Toxemias → Targets

↓ Potassium in erythrocytes
Lauricella and Giorgetti B97445/54
Vasopressin in body fluids
Scavo C4930/54 (discussion)
Cortisol/cpd B ratio in
adrenal venous blood
Bush C5402/55
Corticoids in urine
Bevacqua and Rognoni C5522/54
Riviere et al C3140/54
↑ Aldosterone in urine
Venning et al C3644/55
Ø 17 KS in amniotic fluid
Kinnunen C795/54
↓ 17 KS in urine
Wurterle C2617/54
Ø Histamine in blood
van den Driessche C3334/54
EEG
Poidevin C6664/55
Blood pressure ← ABA (various)
Friedberg and Schanz C337/54
Blood pressure ← ABA (apresoline) ↓
Draps B97903/54
(hypertensive crisis)

Other Pregnancy Diseases

Gynecomastia—Pathogenesis
Peters et al C1815/55 (review)
Hyperemesis—Pathogenesis
Jarvinen and Uuspaa C793/54
(hypophysis adrenals)
C2802/54 (G A S)
Youssef and Staemmler C1568/55
(adrenals+serologic reactions)
Hyperemesis ← Cortisone
Monckeberg and Pardo C2270/54
Hyperemesis ↑ → Nitrogen in blood
Monckeberg and Pardo C2270/54
Hyperemesis ↓ → NaCl in blood
Monckeberg and Pardo C2270/54
Hyperemesis ↑ → Potassium in blood
Monckeberg and Pardo C2270/54
Hyperemesis ↓ → Calcium in blood
Monckeberg and Pardo C2270/54
Hyperemesis ↓ → Alkaline reserve in blood
Monckeberg and Pardo C2270/54
Hyperemesis ↓ → Corticoids in blood
Youssef and Staemmler C1568/55
Hyperemesis → 11 oxycorticoids 17 KS
in urine ← ACTH ↑
Jarvinen and Uuspaa C793/54
Hyperemesis ↓ → Histaminase in blood
Youssef and Staemmler C1568/55
Hyperemesis → Eosinophils in blood ←
ACTH
Jarvinen and Uuspaa C793/54
C2802/54
Postpartum hemorrhage ↑ → Cholesterol
in blood
Schneeberg et al B97972/53

Orchitis (mumps) ← ACTH and/or cortisone + Antibiotic
Jahn B98515/54 (review)
Kinsell C3523/55

Orchitis (mumps) ← Cortisol + Antibiotic
Jahn B98515/54 (review)

Penis (plastic induration) ← Cortisone (locally) + Hyaluronidase (locally)
Bodner et al B99537/54

Penis (plastic induration) ← Cortisol (locally)
Bodner et al. B99537/54

Precocious puberty → 3-β steroids in urine
Lelong et al. C5577/54

Premature pubarche → Corticoids 17 KS in urine
Thamdrup C4474/55

Prostate hypertrophy ← Cortisone
Sotiriou C648/54

Testis tumor → Corticoids in urine ← Ionizing rays
Soanes and Dodson C6711/54

Male Accessory Sex Organs

Comb ← Testis extirpation + Testoids + Muscular exercise ↓ in fowl
Wong et al B97922/54 (size)

Epididymis ← Adrenalectomy ↓ + Testis extirpation in mouse
Delost B96934/53 (secretion)

Epididymis ← Testis extirpation ↑ in mouse
Delost B96934/53 (secretion)

Mammary glands ← Hypophysectomy + STH + LTH + Adrenalectomy + Folliculoids + Luteoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + STH + LTH + Cortisol + Testis extirpation in rat
Lyons et al C4255/54

Mammary glands ← Hypophysectomy + STH + LTH + Folliculoids + Luteoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + STH + Adrenalectomy + Folliculoids + Luteoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + STH + Folliculoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + STH + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + LTH + Adrenalectomy + Folliculoids + Luteoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands ← Hypophysectomy + Folliculoids + Testis extirpation in rat
Lyons et al. C4255/55

Mammary glands (gynecomastia) ← Folliculoids (TACE) + Tumor in man
Mortensen B97561/53

Penis ← DOCA + Folliculoids + Testis extirpation + Testoids + Thyroid extract + Age (senile) in rat
Korenchevsky et al C5575/53

Preputial gland ← Hypophysectomy + STH + Testis extirpation + Testoids in rat
Huggins et al. C6532/55

Preputial gland ← ACTH + Casein + Potassium chloride + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53

Preputial gland ← STH + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54

Preputial gland ← STH + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53

Preputial gland ← Adrenalectomy + Cortisol + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54

Preputial gland ← Adrenalectomy + DOCA + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54

Preputial gland ← Adrenalectomy + MAD + Nephrectomy (partial) + NaCl *in rat*
Salgado C1002/54

Preputial gland ← DOCA + Folliculoids + Testis extirpation + Testoids + Age (senile) in rat
Korenchevsky et al. C5575/53

Preputial gland ← DOCA + Folliculoids + Testoids + Thyroid extract + Age (senile) in rat
Korenchevsky et al C5575/53

Preputial gland ← Folliculoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53

Preputial gland ← Testoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53

Adrenaline derivatives in toad
Houssay and Burgos C6549/54 (spermiation)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↓ in hamster
Teodoru and Shwartzman C1066/54 (weight)
Cortisone Ø in man
Nelson C2240/54 (biopsy)
Cortisone in rabbit
Bracali and Spigolon C11/54 (histology)
Businco B99102/54 (histology)
Cortisone ↓ in rabbit
Schmid Bircher B99368/54 (weight)
Cortisone in rat
Soulairac et al C6445/55 (histology)
Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55 (weight)
Cortisone+Diseases (various) in man
Burt and Velardo B97411/54 (spermatogenesis)
DOCA in fish
Egami C4212/55 (testis ova)
DOCA in rat
Soulairac et al C6445/55 (histology)
DOCA+Folliculoids in fish
Egami C4212/55 (testis ova)
DOCA+Folliculoids+Testoids+Thyroid extract+Age (senescent) in rat
Korenchevsky et al C5575/53 (weight)
Folliculoids+Age (larval) in frog
Chang and Witschi C4490/55 (histology)
Folliculoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Testis extirpation (partial)+Para oxypropiophenone in rat
Chirico and Viola C311/54 (weight histology)
Testoids+Age (larval) in frog
Chang and Witschi C4490/55 (histology)
Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Thyroxin+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Pinealectomy in fowl
Negri and Marconi B98104/54 (spermatogenesis)
Pinealectomy ↑+Age (immature) in rat
Thièblot B98670/54 (weight)
Thymectomy Ø in rat
Shibata et al B97619/52 (weight)
Thymus extract in rat
Matteini and Marabini B99837/53 (weight)
Lymph node extract in rat
Matteini and Marabini B99837/53 (weight)
Liver extract in rat
Matteini and Marabini B99837/53 (weight)

Testis ← Stressors

Tuberculosis+Antibiotic isonicotinic acid hydrazide PAS thiosemicarbazone in guinea pig
Chiti and Astengo B99730/54 (ascorbic acid)
Bile duct ligature ↓ in rat
Telkka and Kuusisto B97576/54 (weight)
Hypoxia+Vitamin E in rat
Saha C5572/54 (histology)
Drugs (SC-4473 SC 3402) in rat
Sturtevant C2757/55 (weight)
Heparin ↓ in rabbit
de Matteis B97350/54 (weight)
Lithospermum ↓ in rat
Slusher B98713/54 (ascorbic acid)
Phtalylsulfathiazole in rat
Cresseri C2155/54 (histology)
Starvation in man
Paullada C5443/55 (histology)
Zubiran et al C3157/54 (histology)

Testicular Diseases

Eunuchoidism → 11 oxycorticoids in urine ← GTH Ø
Plate B97022/53
Eunuchoidism → 17 KS folliculoids in urine ← *GTH* ↑
Plate *B97022/53*
Hypotestoidism → TTH in blood corticoids in urine
Fromm et al C5994/55
Hypotestoidism → 17 KS in urine ← *GTH* testoids
Weller C6537/54 (fractions)
Hypotestoidism → Adrenals
Fromm et al C5994/55 (weight)
Hypotestoidism → Eosinophils in blood ← Adrenaline
Fromm et al C5994/55
Male climacterium ← ACTH+Testoids
Balestra C1279/53
Orchitis (mumps) ← ACTH
Solem B98025/54

Seminal vesicles ← Cpd B+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Seminal vesicles ← Folliculoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54

Seminal vesicles ← Testis extirpation+Testoids in rat
Arzac C6647/55

Seminal vesicles ← Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54

Seminal vesicles ← Pregnenolone+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Seminal vesicles ← Thyroxin+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54

Seminal vesicles ← Pinealectomy ↑+Age (immature) in rat
Thieblot B98670/54 (weight)

Various accessory sex organs ← Hypophysectomy+ACTH+Testis extirpation in rat
Li C1156/54

Various accessory organs ← Hypophysectomy+Folliculoids testoids+Age (larval) in frog
Chang and Witschi C4490/55

Various accessory organs ← Folliculoids testoids+Age (larval) in frog
Chang and Witschi C4490/55

Vas deferens ← ACTH in rat
Soulairac et al C6445/55

Vas deferens ← Adrenalectomy+Testis extirpation in mouse
Delost B96934/53
(hypertrophy of epithelium)

Vas deferens ← Cortisone DOCA in rat
Soulairac et al C6445/55

Vas deferens ← Testis extirpation in mouse
Delost B96934/53
(hypertrophy of epithelium)

THYROID

(For radioiodine in thyroid cf p 300)

Generalities
Barker C3435/55
(physiology—review)
Reiss C3731/54
(thyroid and psychosis)

Thyroid ← Stimuli

Hypophysectomy in fowl
Frantz C3798/54
(weight histology)

Hypophysectomy ↓ in rat
Tobias et al B97093/54 (weight)

Hypophysectomy+Hypophyseal extract (erythropoietic) in rat
Contopoulos et al B98141/54
(histology)

Hypophysectomy+STH Ø in rat
Hartmann B98561/54 (weight)

Hypophysectomy+STH+Folic acid vitamin B_1 in rat
Penbos and Foglia C6746/54
(weight)

Hypophysectomy+CTH+TTH in rat
Noach C5995/55 (weight)

Hypophysectomy+TTH+Folliculoids ↑ in rat
Noach C4455/55 (weight)

Hypophysectomy+TTH+Folliculoids+Testis extirpation in rat
Noach C5995/55 (weight)

Hypophysectomy+Adrenaline ↓ in rat
Badrick et al C4501/55
(phosphorus radioactive in thyroid)

Hypophysectomy+Cortisone in rat
Greenberg and Aterman B99025/54
(weight/body weight)
Mercier Parot and Tuchmann Duplessis B99828/53 (histology)

Hypophysectomy+Folliculoids Ø in rat
Noach C4455/55 C5995/55
(weight)

Hypophysectomy+Folliculoids+Testis extirpation+*Pancreatectomy* (partial)+Diet (force fed) in rat
Foglia et al C4922/54 (weight)

Hypophysectomy+Pregnancy in monkey
Smith C2760/55 (weight)

Hypophysectomy+Testis extirpation+*Testoids+Pancreatectomy (partial)*+Diet (force fed) in rat
Foglia et al C4922/54 (weight)

Hypophysectomy+(Cold+Muscular exercise) ↓ in rat
Badrick et al C4501/55
(phosphorus radioactive)

Hypophysectomy+Carcinogen in rat
Richardson et al C2046/53
(weight histology)

Hypophysis irradiation (deuterons) ↓ in rat
Tobias et al B97093/54 (weight)

Hypophyseal anterior lobe extract (erythropoietic) in rat
Contopoulos et al C1899/55
(weight)

ACTH Ø+Pregnancy in monkey
Schmidt and Hoffmann B96565/54
(weight)

ACTH Ø+Thiourea in rat
Begg C4360/55 (weight)

ACTH ↓+*Thiourea*+*Heredity*+Nerves (emotions) in rabbit
Kracht C1125/54
(weight/body weight)

Preputial gland ← MAD+Thyroidectomy+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54

Preputial gland ← Thyroxin+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53

Prostate ← Hypophysectomy ↓ in rat
Tobias et al B97093/54 (weight)

Prostate ← Hypophysectomy+STH+Testis extirpation+Testoids in rat
Huggins et al C6332/55

Prostate ← Hypophysectomy Ø+Gonadectomy in rat
Hertz C2249/54

Prostate ← Hypophysectomy+Folliculoids+Testis extirpation+Pancreatectomy (partial)+Diet (force fed) in rat
Foglia et al C4922/54

Prostate ← Hypophysectomy+Testis extirpation+Testoids+Pancreatectomy (partial)+Diet (force-fed) in rat
Foglia et al C4922/54

Prostate ← Hypophysectomy+Carcinogen in rat
Richardson et al C2406/53

Prostate ← Hypophysis irradiation (deuterons) ↓ in rat
Tobias et al B97093/54 (weight)

Prostate ← Adrenalectomy Ø+Gonadectomy in rat
Hertz C2249/54

Prostate ← Adrenalectomy+Lithospermum ↓ in rat
Slusher B98713/54 (weight)

Prostate ← Corticoids (various)+Testis *extirpation+Testoids in rat*
Pincus and Dorfman C5136/55

Prostate ← Cortisone Ø+Gonadectomy in rat
Hertz C2249/54

Prostate ← Cortisol+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Prostate ← DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senescent) in rat
Korenchevsky et al C5575/53

Prostate ← Cpd B+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Prostate ← Gonadectomy+Starvation Ø in rat
Hertz C2249/54

Prostate ← Pregnenolone+Testis *extirpation*+Testoids in rat
Pincus and Dorfman C5136 55

Seminal vesicles ← Hypophysectomy ↓ in rat
Tobias et al B97093/54 (weight)

Seminal vesicles ← Hypophysectomy+STH+Testis extirpation+Testoids in rat
Huggins et al C6322/55

Seminal vesicles ← Hypophysectomy+Cortisone ↑ in rat
Greenberg and Aterman B99025/54 (weight/body weight)

Seminal vesicles ← Hypophysectomy+Folliculoids+Testis extirpation+*Pancreatectomy (partial)+Diet* (force fed) in rat
Foglia et al C4922/54

Seminal vesicles ← Hypophysectomy+Testis extirpation+Testoids+Pancreatectomy (partial)+Diet (force fed) in rat
Foglia et al C4922/54

Seminal vesicles ← Hypophysis irradiation (deuterons) ↓ in rat
Tobias et al B97093/54 (weight)

Seminal vesicles ← Hypophyseal anterior lobe extract (erythropoietic) in rat
Contopoulos et al C1899/55

*Seminal vesicles ← ACTH+Casein+*Potassium chloride+Protein deficiency in rat
Aschkenasy and Dray C1990/54

Seminal vesicles ← ACTH+Potassium chloride+Protein deficiency in rat
Aschkenasy and Dray B99605/54 (weight)

Seminal vesicles ← STH+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54

Seminal vesicles ← STH+Protein deficiency in rat
Aschkenasy and Dray B99606/54 *(weight)*

Seminal vesicles ← GTH+Testis extirpation in rat
Arzac C6647/55

Seminal vesicles ← Adrenalectomy+Lithospermum ↓ in rat
Slusher B98713/54 (weight)

Seminal vesicles ← ACE in rat
Contopoulos et al C1899/55

Seminal vesicles ← Corticoids (various)+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Seminal vesicles ← Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55

Seminal vesicles ← Cortisol+Testis extirpation+Testoids in rat
Pincus and Dorfman C5136/55

Seminal vesicles ← DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senescent) in rat
Korenchevsky et al C5575/53

DOCA+Folliculoids+Testis extirpation +Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
Ovariectomy+Ovary transplant in spleen in rat
Bornmann et al C6002/55 (weight)
Ovarian transplant (immature in testis) ↓ in rat
Fazzari B98383/53 (function)
Folliculoids+Sex in cattle
Clegg and Cole C158/54 (weight)
Folliculoids ↑+Testis extirpation in rat
Noach C4455/55 C5993/55 (weight)
Folliculoids+Thiourea in rat
Crepax C96/53 (histology)
Folliculoids+Tumor in man
Hohlweg B97486/53 (histology)
Folliculoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Testis extirpation+Testoids ↓+Thymectomy in guinea pig
Comsa B99725/54 (weight histology)
Testis extirpation+Thymectomy+Thymus extract ↓ in guinea pig
Comsa B99725/54 (weight histology)
Testoids (methyltestosterone) ↑ in cattle
Krueger et al C1639/54 (weight)
Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Thiourea+Tumor (transplanted) ↓ in rat
Begg C4360/55 (weight)
Thiourea+Cold+Ascorbic acid in rat
Freedman and Gordon C1799/55 (weight)
Thiourea+Nerves (emotions) ↑ in rat
Giberti C2347/54 (weight)
Thiourea withdrawal+Trauma ↑ in rat
Giberti and Borghi B98679/54 (weight)
Thiourea withdrawal+Nerves (conditioned reflexes emotions pain) ↑ in rat
Giberti and Borghi B98679/54 (weight)
Thyroxin+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/55 (weight)
Pancreatectomy in dog
Yosioka B98065/54 (histology)
Thymectomy Ø in rat
Ogawa and Itagaki B98640/54 (phosphorus radioactive)
Shibata et al B97619/52 (weight)
Thymectomy (partial) in guinea pig
Gyllensten and Ringertz C1294/54 (phosphorus radioactive)
Thymus extract in rat
Matteini and Marabini B99837/53 (weight histology)
Thymus extract+Season in rat
Attardi B99370/53 (histology)
Lymph node extract in rat
Matteini and Marabini B99837/53 (weight histology)
Splenectomy ↓+Ascorbic acid deficiency in guinea pig
Gabe and Parrot B99783/52 (function)
Liver extract in rat
Matteini and Marabini B99837/53 (weight histology)
Age (senile) in man
Scopinaro and Pende B96720/53 (histology sclerosis)
Age in rabbit
Blum B99659/54 (weight)
Heredity+Nerves (emotions) in rabbit
Kracht C1125/54 (histology)
Season+Heredity in rabbit
Kracht C1125/54 (weight)

Thyroid ← Stressors

Diseases (various)
Scopinaro and Pende B98806/52 (histology)
Tuberculosis Ø in rabbit
Freerksen C1124/54 (weight)
Tuberculosis+Antibiotic in guinea pig
Chiti and Astengo B99750/54 (ascorbic acid)
Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99105/54 (histology)
Tuberculosis+Paraoxypropiophenone ↑ in rabbit
Freerksen C1124/54 (weight)
Tuberculosis+PAS in guinea pig
Chiti and Astengo B99750/54 (ascorbic acid)
Tuberculosis+PAS in guinea pig and rabbit
Besta et al B99108/53 (histology)
Tuberculosis+Thiosemicarbazone in guinea pig
Chiti and Astengo B99750/54 (ascorbic acid)
Trauma Ø in rat
Boas and Foley C3570/55 (hexosamine)
Bile duct ligature
Telkka and Kuusisto B97576/54 (weight epithelium)
Cold ↑ in guinea pig
del Conte and Stux B98295/54 (function)

ACTH + Thiourea + Cold in rat
Freedman and Gordon C1799/55 (weight)
ACTH (to mother) Ø + Pregnancy + Age (foetal) in monkey
Schmidt and Hoffmann B96565/54 (weight)
ACTH ↓ + Tuberculosis in rabbit
Freerksen C1124/54 (weight)
ACTH + Casein + Potassium chloride + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 B99606/54 (weight)
STH in guinea pig
Larizza et al. B99367/53 (histology)
STH in rat
Matteini and Marabini B99837/53 (weight histology)
STH + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
STH + Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
GTH Ø in rat
Mandl C285/54 (weight)
GTH ↓ + Adrenalectomy in rat
Mandl C285/54 (weight)
TTH ↑ + Tuberculosis in rabbit
Freerksen C1124/54 (weight)
TTH + Cortisone Ø in guinea pig
Bodlund and Gyllensten C1315/54 (phosphorus radioactive cell height)
TTH + Cortisone ↑ in guinea pig
Bodlund and Gyllensten C1315/54 (weight)
TTH + Thymectomy (partial) ↑ in guinea pig
Gyllensten and Olsson B97249/54 (weight acinar cell height)
Adrenalectomy in rat
Mandl C285/54 (weight)
Adrenalectomy Ø in rat
Ogawa B98639/53 (phosphorus radioactive)
Adrenalectomy ↑ in rat
Shibata B98625/54 (phosphorus radioactive)
Adrenalectomy + Cortisone ↓ in rat
Shibata B98625/54 (phosphorus radioactive)
Adrenal demedullation in rat
Verne and Hebert C6451/55 (histology)
Adrenaline Ø in rat
Shibata et al C312/54 (weight)
Adrenaline ↓ in rat
Badrick et al C4501/55 (phosphorus radioactive)
Adrenaline + Thiourea + Cold in rat
Freedman and Gordon C1799/55 (weight)
Noradrenaline in rat
Shibata et al C312/54 (weight)
ACE in rat
Contopoulos et al. C1899/55 (weight)
ACE + Thiourea + Cold in rat
Freedman and Gordon C1799/55 (weight)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↑ in guinea pig
Bodlund and Gyllensten C1315/54 (weight phosphorus radioactive cell height)
Cortisone in rabbit
Businco B99102/54 (histology)
Cortisone ↓ in rabbit
Bracali and Spigolon C11/54 *(function)*
Cortisone in rat
Closon et al C6793/55 (histology)
Delille and Fekete C6755/54 (histology)
Mercier Parot and Tuchmann *Duplessis B99828/53 (histology)*
Cortisone ↓ in rat
Hirvonen and Rasanen B96676/54 (percentage of epithelium)
Cortisone ↑ in rat
Bodansky and Money B96571/54 (weight/body weight)
Hirvonen and Rasanen B96676/54 *(percentage of colloid)*
de Poli and Martini C2351/54 (weight)
Cortisone Ø + Thiourea in rat
Begg C4360/55 (weight)
de Poli and Martini C2351/54 (weight)
Cortisone + Thyroid extract in rat
Greenberg and Aterman C5361/55 (weight)
Cortisone ↓ + Tuberculosis in rabbit
Freeksen C1124/54 (weight)
Cortisone + Tuberculosis + Antibiotic isonicotinic acid hydrazide in rabbit
Freeksen C1124/54 (weight)
Cortisone + Ionizing rays in dog
Allam et al B99689/54 (thyroid cancer transplant)
Cortisol + Thiourea in rat
D Angelo C5073/55 (weight)
Cortisol + Ionizing rays in dog
Allam et al B99690/54 *(thyroid cancer transplant)*
DOCA in bird
Kobayashi and Okubo C5441/54 (histology)
DOCA in hamster
Knigge C263/54 (histology)

Vasopressin in urine
Scavo et al C5636/55
Corticoids in blood
Bayliss C6392/55 (discussion)
Peterson and Wyngaarden C4077/55
(cortisol radioactive in blood)
∅ Corticoids in blood (free and
conjugated) ← ACTH
Klein et al C1819/55
Corticoids in urine
Luetscher and Curtis C4973/55
(aldosterone)
Piotti and Bonomi C1350/54
(17 hydroxycorticoids reducing
corticoids)
Corticoids in urine ← ACTH
Bricaire et al B99527/54
(reducing steroids)
Gabrilove and Soffer C4514/55
(F Cs)
de Gennes et al C1921/54
(reducing)
Goldenberg et al C1820/55
Corticoids in urine ← ACTH+Thyroid
extract ↑
Goldenberg et al C1820/55
Corticoids in urine ← Thyroxin ↑
Hubble C945/55
(17 ketogenic steroids)
17 KS in urine
Beierwaltes C421/54
Piotti and Bonomi C1350/54
17 KS in urine ← ACTH
Beierwaltes C421/54
Bricaire et al B99527/54
Gabrilove and Soffer C4514/55
de Gennes et al C1921/54
Yrarrazaval and Barzelatto
C2297/54
17 KS in urine ← ACTH+Thyroid extract
Goldenberg et al C1820/55
17 KS in urine ← TTH ∅
Gabrilove and Soffer C4514/55
17 KS *in urine ← Thyroxin ↑*
Beierwaltes C421/54
17 KS in urine ← Water load
Oleesky C1788/55
↓ Histamine in skin
Loeser C549/54
Hypophysis
Berkheiser C931/55 (histology)
↓ Adrenals
Berkheiser C931/55 (weight lipids)
Eosinophils in blood ← ACTH
Beierwaltes C421/54
Bricaire et al B99527/54
de Gennes et al C1921/54
Vessels
Schettler and Dietrich C2927/53
(histology)

Connective tissue
Iversen C823/54 (discussion)
Tumor (cancer—discussion)
Anonymous C6018/55

Hyperthyroidism

Hyperthyroidism—Pathogenesis
Blazquez C176/52
(struma ovarii extirpation)
Cassano and Baschieri B98674/54
(endocrines nerves—review)
Fugazzola B98427/53
(high tension current)
Lafon et al. C1544/54
(cranial trauma)
Hyperthyroidism ← Hypophysis irradiation
(*ionizing rays*)
Gedda and Lindgren C3002/54
Hyperthyroidism ← ACTH
Landau and Gajewska B99250/53
Hyperthyroidism ← ACTH+
Thyroidectomy
Schlicke and Berghan B97856/54
Hyperthyroidism ← Jaundice
Wiktor and Kedra C4697/54
Hyperthyroidism ← ABA
(phenothiazine derivatives)
Broghe and Jorgensen B99209/54

Hyperthyroidism → Targets

BMR ← Adrenaline ↑
Horstmann B97578/54
Glucose in blood ← Insulin
Hernberg and Lamberg *C1561/55*
Glucose in blood ← Fasting ↓
Gastaldi and Fedeli B99742/54
Ketones in blood ← Fasting ↑
Gastaldi and Fedeli B99742/54
Protein in blood ← Muscular exercise ↑
Finiani C5523/53
Urea in urine ← Fasting ↑
Gastaldi and Fedeli B99742/54
Cl in urine ← Vasopressin
Scavo et al C5636/55
NaCl in urine ← Thyroidectomy
Chiatellino et al B99060/54
Diuresis ← Vasopressin
Scavo et al C5636/55
Diuresis ← Thyroidectomy
Chiatellino et al B99060/54
Diuresis ← NaCl
Scavo et al C5636/55
Vasopressin in urine
Scavo et al C5636/55
Cortisol in blood ← Cortisol
Peterson and Wyngaarden C5930/55
Corticoids in urine
Piotti and Bonomi C1350/54
(17 hydroxycorticoids reducing
corticoids)

Cold in hamster
Deane and Lyman B97428/54 (histology)
Cold in rat
Deane and Lyman B97428/54 (cell height)
Dempsey and Peterson C727/55 (histology electron microscope)
Cold+Muscular exercise in rat
Badrick et al C4501/55 (phosphorus radioactive in thyroid)
Cold withdrawal in rat
Catz et al C1581/54 (histology)
Hibernation in hamster
Deane and Lyman B97428/54 (histology)
Electroshock in guinea pig
del Conte et al C1557/55 (histology)
Hypoxia in rat
Goebel et al B99309/54 (histology)
ABA (hexamethonium bromide) ↓ in rat
Shibata et al C312/53 (weight)
Anesthetic (barbiturates) Ø in rat
Schwarz C4457/55 (weight)
Bacterial extract (*Pseudomonas*) in rat
Takeda et al C968/53 (histology)
Foam rubber (i p) in rat
Pecchiai C9/54 (histology)
Histamine Ø in guinea pig
Lofgren and Isotalo C29/54 (weight histology)
Isonicotinic acid hydrazide in guinea pig
Besta et al B99105/54 (histology)
PAS in guinea pig and rabbit
Besta et al B99108/53 (histology)
Phenylbutazone ↑ in man
Morgans and Trotter C6945/55 (weight)
Starvation in man
Paullada C5443/55 (histology)
Ascorbic acid deficiency ↓ in guinea pig
Gabe and Parrot B99783/52 (function)
Diurnal variations in mouse
Bander C3745/53 (histology)

THYROID DISEASES

Hypothyroidism

Hypothyroidism—Pathogenesis
Bastenie C308/54 (adrenals)
Cassano and Baschieri B98674/54 (endocrines nerves—review)
Lafon et al C1544/54 (cranial trauma)
Hypothyroidism ← STH+GTH+Thyroid extract
Briskas et al B98426/53
Hypothyroidism ← Cortisone+Thyroxin
Bastenie B96888/53 (hypophyseal)

Hypothyroidism → Targets

Resistance ← ACTH ↑+Thyroxin
Bastenie B96888/53 (hypophyseal)
Body weight ← STH
Kinsell C4257/55
Glucose (arteriovenous difference in blood) ← STH+Glucose
Elrick C5911/55
Ø Glucose in blood ← Protein
Coth et al C1145/54
↓ Ketones in blood ← Protein
Goth et al C1145/54
Nitrogen in urine ← ACTH Ø
Goldenberg et al C1820/55
Nitrogen in urine ← ACTH+Thyroid extract ↑
Goldenberg et al C1820/55
Nitrogen in urine ← STH
Kinsell C4257/55
Amino acid in blood urine ← STH+Amino acid
Elrick C5911/55
Creatine in urine ← ACTH Ø
Goldenberg et al C1820/55
Creatine in urine ← ACTH+Thyroid extract ↑
Goldenberg et al C1820/55
Uric acid/creatinine ratio in urine ← ACTH+Thyroid extract
Goldenberg et al C1820/55
Cl in urine ← Vasopressin
Scavo et al C5636/55
Na in urine ← ACTH Ø
Goldenberg et al C1820/55
Na in urine ← ACTH+Thyroid extract ↑
Goldenberg et al C1820/55
NaCl balance ← Cortisone+Thyroxin
Soffer et al C815/54
Potassium in urine ← ACTH Ø
Goldenberg et al C1820/55
Potassium in urine ← ACTH+Thyroid extract ↑
Goldenberg et al C1820/55
Potassium in urine ← STH
Kinsell C4257/55
↓ Phosphorus in blood
Bottura C473/54
Phosphorus in urine ← ACTH Ø
Goldenberg et al C1820/55
Phosphorus in urine ← ACTH+Thyroid extract ↑
Goldenberg et al C1820/55
Phosphorus in urine ← STH
Kinsell C4257/55
Water (extracellular fluid space) ← Cortisone ↑
Soffer et al C815/54
Diuresis ← Vasopressin NaCl
Scavo et al C5636/55
Diuresis ← Water load
Hubble C915/55
Olecsky C1788/55

Parathyroid ← Various

Hypophysectomy in rat
Eger and Gothe B99215/54
(nuclear size)

Hypophysectomy + Nephrectomy (partial) + ERH (kidney wrapping) in rat
Eger B98259/53
(weight, histology function)
Eger and Gothe B99215/54
(nuclear size)

STH in rat
Matteini and Marabini B99837/53
(*weight*)

Cortisone in guinea pig and rabbit
Businco B99102/54 (histology)

Thymus extract in rat
Matteini and Marabini B99837/53
(weight)

Lymph node extract in rat
Matteini and Marabini B99837/53
(weight)

[Nephrectomy (partial) + ERH (kidney *wrapping*)] ↑ *in rat*
Eger B98259/53
(weight, histology function)
Eger and Gothe B99215/54
(nuclear size)

Liver extract in rat
Matteini and Marabini B99837/53
(weight)

Bacterial extract (*Pseudomonas*) in rat
Takeda et al. C968/53 (histology)

Foam rubber (i p) in rat
Pecchiai C9/54 (histology)

PANCREAS

Generalities
Best et al C5454/55 (review)
Fedeli and Jelmoni C5634/55
(weight in rabbit)
Houssay et al. B98564/54
(metacorticoid diabetes mellitus)
Verne and Hebert C19_7/54
(relation to adrenals)

Pancreas ← Stimuli

Hypophysectomy (discussion)
Baker C5933/55 (zymogenic cells)

Hypophysectomy ↓ in rat
Haist et al. C5536/55
(weight amylase)
Kinash and Haist B98995/54
C4944/55 (weight, histology)

Hypophysectomy + Hypophyseal anterior lobe extract, in rat
Haist C4254/55 (amylase)

Hypophysectomy + ACTH ↑ in rat
Haist C4245/55 (weight)
Haist et al C5536/55
(weight amylase)
Kinash and Haist B98995/54
(Langerhans islets/body weight)

Hypophysectomy + STH in rat
Baker and Abrams C4237/55
(weight)
Haist C4254/55 (pancreas Langerhans islets—weight amylase)
Mosca B99044/54 (acinar cells Langerhans islets)

Hypophysectomy + STH Ø + Aging in rat
Mosca B99044/55
(α/β cell ratio)

Hypophysectomy + LTH + Diet, in pigeon
Riddle C4976/55 (weight, histology)

Hypophysectomy + Adrenalectomy + Alloxan in rat
Peden C1564/55 (histology)

Hypophysectomy + Cortisone (discussion)
Baker C5933/55 (zymogenic cells)

Hypophysectomy + Cortisone ↑ in rat
Baker and Abrams C4237/55
(weight)
Haist C4254/55 (weight)
Kinash and Haist B98995/54
(Langerhans islets weight/body weight)

Hypophysectomy + Cortisol
(discussion)
Baker C5933/55 (zymogenic cells)

Hypophysectomy + Folliculoids + Testis extirpation + Pancreatectomy (partial) + Diet (force-fed) in rat
Foglia et al. C4922/54 (histology)

Hypophysectomy + Testis extirpation + Testoids + Pancreatectomy (partial) + Diet (force-fed) in rat
Foglia et al C49_2/54 (histology)

Hypophysectomy + Thyroid extract, in rat
Haist C4254/55 (amylase)
Kinash and Haist C4944/55
(weight histology)

Hypophysectomy Ø + Alloxan in rabbit
Nagahama B96563/53 (histology)

Hypophysectomy + Aging Ø in rat
Mosca B99044/54 (α/β cell ratio)

ACTH in dog
Foa et al C4144/55 (histology)

ACTH Ø in rat
Haist et al. C5536/55
(weight amylase)

ACTH ↑ in rat
Kinash and Haist B98995/54
(Langerhans islets weight/body weight)

ACTH Ø + Pregnancy in monkey
Schmidt and Hoffmann B96565/54
(histology)

Ø Corticoids in urine
Della Beffa and Pietra B98299/54
(G Cs)
Hubble C945/55
(17 ketogenic steroids)
Corticoids in urine ← ACTH
de Gennes et al C1921/54
(reducing)
Corticoids in urine ← TTH
Gabrilove and Soffer C4514/55
(F Cs)
11 oxysteroids ← ACTH
Hernberg and Lamberg C1561/55
Corticoids in urine ← Trauma
Giberti and Lanzoni B98680/54
C2360/54
17 KS in urine
Giberti and Lanzoni B98680/54
Piotti and Bonomi C1350/54
17 KS in urine ← ACTH
de Gennes et al C1921/54
Hernberg and Lamberg C1561/55
17 KS in urine ← Thyroidectomy
Chiatellino et al. B99060/54
17 KS in urine ← Thyroid irradiation
(ionizing)
Piazzi C1428/ND
17 KS in urine ← Trauma
Giberti and Lanzoni B98680/54
C2360/54
↑ Histamine in cells
Loeser B96957/54
Vitamin B in urine ← ACE+DOCA
Travia and Pelosio C315/50
Pyruvic acid in blood ← Muscular
exercise ↑
Fimiani C3083/53
EEG
Condon et al C417/54
Poidevin C6664/55
Adrenals
Lamberg C3000/54
(function–discussion)
Eosinophils in blood ← ACTH
de Gennes et al C1921/54
Hernberg and Lamberg C1561/55
Eosinophils in blood ← Muscular exercise ↓
Fimiani C5523/53
Eosinophils in blood ← Fasting ↓
Castaldi and Fedeli B99742/54
Ø Lymphocytes in blood
Wilflingseder and Villinger B98387
↑ Lymphocyte diameter
Hernberg B98254/54
Lymphocyte diameter ← Thyroidectomy ↓
Hernberg B98254/54
Kidney (function)
Giovannetti and Pasero C3039/54
Liver (development of cirrhosis) ←
ACTH and/or cortisone ↑
Hartfall B98133/54
Bones
Fourman C3694/55

Connective tissue
Iversen C823/54 (discussion)
Tumorigenesis
Gavosto et al B98721/54
↓ Tumor (incidence of mammary and
genital cancer)
Loeser B96957/54

Other Thyroid Diseases

Goitre–Pathogenesis (phenylbutazone)
Morgans and Trotter C6945/55
Mongolism–Pathogenesis
Benda B98129/53 (hypophysis)
Brown C5576/54 (adrenals)
Mongolism → 17 KS in urine
Salvatierra C2123/53
Myxedema (circumscribed) → Uric
acid/creatinine ratio in urine ←
Adrenaline ↑
Hamada B98566/54
Myxedema (circumscribed) →
Eosinophils in blood ← ACTH
Hamada B98566/54
Sudden enlargement of thyroid–
Pathogenesis (medulloids)
Menof B99704/54
Thyroid aplasia → Adrenals
Burt and Cohen B96388/53
(weight histology)
Thyroid hypophyseal syndrome–
Pathogenesis (adrenals)
Lamberg C3000/54
Thyroid hypophyseal syndrome ←
Hypophysis irradiation (ionizing
rays)
Lamberg C3000/54
Thyroiditis ← ACTH
Gjørup and Gormsen C5760/54
Thyroiditis ← ACTH+Thiourea+
Ionizing rays
Mohacek and Radosević C5755/54
Thyroiditis ← Cortisone
Crile C3011/54 (giant cells)
Gjørup and Gormsen C5760/54
Hunter and Sheehan B98509/54
Thyroiditis ← Cortisone+Thiourea+
Ionizing rays
Mohacek and Radosević C5755/54
Thyroiditis ← Salicylate
Danopoulos and Melissinos
B99951/54 (rheumatic)
Various thyroid diseases ← ACTH
and/or cortisone
Schermann C4435/55 (discussion)

PARATHYROID

Generalities
Eger B98165/54

Pathogenesis (hypophysis and/or adrenals)
- Anonymous B98206/54 (complications)
- Klotz and Avril B97805/52
- McCullach and Aliviatos C951/54
- Nagahama B96563/53
- Rothfeld and Rodas C4713/54
- de Salcedo C3493/55
- Vague C3254/55

Pathogenesis (ACTH and/or cortisone treatment)
- Aubertin and Faure B96494/53
- Langeron et al C3369/54 C5654/55

Pathogenesis (various)
- Basteme and Godon B96868/54 (pregnancy)
- Blazquez C176/53 (struma ovarii extirpation)
- Braker B98124/53 (trauma nerves)
- McCullagh C5691/54 (hypothalamus tumor)
- Jores et al C4597/54 (hypophyseal tumor)

Diabetes Mellitus ← Various

Hypophysectomy
- Anonymous C6559/55 (discussion)
- Luft C6131/54
- Luft and Oliveccrona C2496/55
- Luft et al C3574/55 C6210/52
- Pertuset B97511/53 (discussion)
- Sprague C956/54 (discussion)

Hypophysectomy+Cortisone+Insulin
- Kinsell et al. C952/54
- Luft et al C3658/55

Hypophysis irradiation (ionizing rays)
- Jores et al C4597/54

ACTH and/or cortisone
- Schermann C4455/55 (discussion)

Hypopituitarism
- Levin C2973/54

Adrenalectomy
- Sprague C956/54 (discussion)

Adrenalectomy+Cortisone+DOCA
- Martin and Wilson C954/54

Adrenalectomy+G Cs+Insulin
- Wortham and Headstream C953/54

Adrenalectomy+Cortisone+Infection+Insulin
- Bergenstal et al C3657/55

Cortisone+Insulin
- McCullach and Alivisatos C951/54

Cortisone+Insulin+Rheumatoid arthritis
- Rosenfeld B98527/54

DOCA+NaCl
- Kuley and Aleksanyan B99291/53 (coma)

Hypocorticoidism+Insulin
- Jersild B99293/53

Testoids
- Klotz and Avril B97805/52

Hepatitis (infectious)
- Zelter C6145/53

Hibernation (artificial)
- Gerest et al C2180/55 (coma)

Paraoxypropiophenone
- Sachsse C4714/54

Diabetes Mellitus → Targets

Body weight ← STH+Insulin
- Kinsell C4257/55

BMR ← Adrenaline ↑
- Horstmann B97578/54

Glucose in blood ← Hypophysectomy ↓+ Insulin
- Luft et al C3574/55

Glucose in blood ← Hypophyseal anterior lobe extract ↓
- Conn C1011/53

Glucose in blood urine ← STH+Insulin
- Kinsell C4257/55

Glucose in blood ← Cortisone ↑
- Kinsell C6133/54

Glucose in blood ← Cortisone ↑+Glucose
- Fajans and Conn B99[illegible]01/54

Glucose in blood ← Cortisone+Potassium chloride ↓
- Kinsell C6133/54

Glucose in blood ← Cortisone+NaCl
- Kinsell C6133/54

Glucose in blood ← DOCA+Insulin
- Bertin and Ghiotti C4715/54

Glucose in blood ← DOCA+Glucose
- Bertin and Ghiotti C4715/54

Glucose ← Pancreatectomy+Insulin+Stress
- Ricketts C957/54 (in blood urine—discussion)

Glucose in blood ← Insulin+ABA (hexamethonium) ↓+Anesthetic
- Griffiths C1254/53

Glucose in blood ← Insulin+Potassium chloride ↓
- Kinsell C6133/54

Glucose in blood ← ABA
- Chowdhury and Werner C499/53 (various)

Glucose in blood ← ABA (hexamethonium) ↓+Anesthetic
- Griffiths C1254/53

Glucose in blood ← Anesthetic (barbiturate) ↓
- Bojanowicz B96497/53

Glucose in blood ← Anesthetic (procaine) ↓ +Glucose
- Loreto and Privitera B99259/53

Glucose in blood ← Psychedrine ↑
- Bojanowics B96497/53

Ketones in blood ← STH+Insulin
- Kinsell C4257/55

Ketones in blood ← Insulin+Potassium chloride ↓
- Kinsell C6133/54

ACTH (to mother) Ø+Pregnancy+
Age (foetal) in monkey
Schmidt and Hoffmann B96565/54
(histology)
(ACTH+Colchicine) ↑ in rat
Cavallero and Mosca B98302/53
(mitosis in islets)
STH
Campbell C4246/55 (discussion)
STH ↑ in guinea pig
Lanzza et al B99367/53
(Langerhans islets)
STH ↑+Pituitary dwarfism in mouse
Cavallero and Dova B98098/54
(amount and size of islets)
STH+Pancreatectomy (partial) in rat
Bennett C4982/55 (histology)
(STH+Colchicine) ↑ in rat
Cavallero and Mosca B98302/53
(mitosis in islets)
STH+Glucose in rat
Haist C4254/55
(Langerhans islets—weight)
LTH in dog
Foa et al C4144/55 (histology)
Adrenalectomy+Adrenaline in rat
Wolff and Ringler C6628/54 (zinc)
Adrenalectomy+Cortisone DOCA in rat
Barrnett and Seligman C1111/54
(disulfide groups of insulin)
Adrenalectomy Ø+Alloxan in rabbit
Nagahama B96563/53 (histology)
Adrenal demedullation in rat
Verne and Hebert C6451/55
(histology)
Adrenaline in rabbit and rat
Wolff and Ringler C6628/54 (zinc)
Cortisone ↑ in guinea pig
Abelove and Paschkis B99017/54
(Langerhans islets)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↑ in man
Verne and Hebert C1927/54
(histology α cells)
Cortisone in rabbit
Businco B99102/54 (histology)
Bracali and Spigolon C11/54
(histology)
Lazarus and Bencosme C5975/55
(histology)
Cortisone Ø in rat
Kinash and Haist B98995/54
(weight)
Cortisone ↑ in rat
Kinash and Haist B98995/54
(Langerhans islets weight/body
weight)
Cortisone+Pancreatectomy (partial)
in dog
Houssay et al B98564/54
(histology)
Cortisone+Alloxan in rabbit
de Meyer C3394/54 (histology)
Cortisone+Na fluoroacetate in rat
Cole et al C6320/55 (citrate)
Cortisol in guinea pig
Hausberger and Ramsay C4481/55
(histology Langerhans islets)
Thiourea ↑+Protein in rat
Aragona and Barone C2401/53
(fibrosis)
Thyroid extract ↑ in rat
Kinash and Haist C4944/55
(weight histology)
Splenectomy ↑+Protein in rat
Aragona and Barone C2401/53
(fibrosis)
Splenectomy ↓+Ascorbic acid deficiency
in guinea pig
Gabe and Parrot B99783/52
(Langerhans islets)
Aging ↓ in rat
Mosca B99044/54 (α/β cell ratio)

Pancreas ← Stressors

Burns in man
Sevitt C3176/55 (histology)
ABA (pendiomid) ↑ in guinea pig
Muller B99876/54
(α cells/β cells ratio)
Acetylcholine in rat
Wolff and Ringler C6628/54 (zinc)
Starvation in rat and rabbit
Wolff and Ringler C6628/54 (zinc)
Ascorbic acid deficiency in guinea pig
Allegretti B97195/54 (β/α cell
ratio volume of islet tissue)
Gabe and Parrot B99783/52
(Langerhans islets)
Diurnal variations in mouse
Bander C3745/53 (histology)

PANCREAS DISEASES

(Cf also Carbohydrate Metabolism p 257)

Diabetes Mellitus

Pathogenesis (G A S)
Fedeli and Jelmoni C5634/55
Cóth et al C3491/54
Mirri C765/54 (complications)
Shallenberger and Kapp C2964/54
Siegenthaler C3092/54
(diseases of adaptation)
Sprague B99941/54
Teichmann and Leupold C5601/55
(with hypocorticoidism)

Pancreatitis ← DOCA + Hepatitis (infectious)
Hoste B96765/53
Pancreatitis → 17 hydroxycorticoids in blood
Engel et al C1913/55
Pancreatitis → Eosinophils in blood
Engel et al C1913/55
Prediabetes → Corticoids in urine
Hoet B98612/54
Steroid diabetes
Frawley C6218/55 (review)
Steroid diabetes → Potassium metabolism
Frawley C6218/55 (discussion)
Steroid diabetes → Phosphorus metabolism
Frawley C6218/55 (discussion)
Steroid diabetes → Pyruvate metabolism
Frawley C6218/55 (discussion)

PINEAL GLAND

Review
Thieblot B98670/54
Pineal gland ← Age in man
Aneti C4[illegible]68/54 (histology)

BLOOD COUNT

(For earlier pertinent data cf also *Stress* pp 404 441 AROS 1951 pp [illegible]67 291 AROS 1952 pp 185 194 AROS 1953 pp 238 251 AROS 1954 pp 425 437)

Generalities
Gordon B98602/54 (review)
Various authors C[illegible]411/55 (leucocytic function—review)

Blood Count ← Stimuli

Nerves (CNS)
Polcz et al B99785/54
Nerves (electrical stimulation of various brain regions and nerves) in monkey
Porter B98592/54 (eosinophils)
Spinal cord section + Parabiosis in rat
Hall and Hall C5921/55 (erythrocytes hematocrit)
ANS (review)
Mark C910/54
Sympathectomy ↓ in man
Kellermann C4179/55 (lymphocytes)
Sympathectomy ↓ + Hypothalamectomy in dog
Keller et al B99382/54 (eosinophils)
Sympathectomy + Insulin Ø in man
Loyke and Hoobler C5518/54 (eosinophils)
Vagotomy ↑ in man
Kellermann C4179/55 (lymphocytes)
Vagus stimulation in rabbit
Wachholder and Beckmann C3744/53 (lymphocytes neutrophils)
Hypothalamectomy + Pancreatectomy ↓ in dog
Keller et al B99382/54 (eosinophils)
Hypothalamus lesion in cat
Laqueur et al C6334/55 (eosinophils)
Hypothalamus lesion + ACTH adrenaline in cat
Laquer et al C6334/55 (eosinophils)
Hypothalamus lesion (posterior) + Adrenaline Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus lesion + Trauma in cat
Laquer et al C6334/55 (eosinophils)
Hypothalamus lesion + Trauma in dog
Hume C6119/54 (eosinophils)
Hypothalamus lesion (posterior) + Trauma Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus lesion + Nerves (emotions)
Hume C6119/54 (eosinophils)
Hypothalamus lesion (posterior) + Histamine Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus stimulation in cat
Anand and Dua C6202/55 C6203 (eosinophils)
Hypothalamus extract ↓ in rat
Slusher and Roberts B97423/54 (eosinophils)
Hypophysectomy Ø in rat
Gordon B98602/54 (eosinophils)
Hypophysectomy ↓ in rat
Contopoulos et al B98717/54 (erythrocyte volume hematocrit)
Gordon B98602/54 (erythrocytes erythrocyte fragility leucocytes lymphocytes)
Montuori and Saborida C2211/54 (erythrocytes hematocrit)
Tobias et al B97093/54 (hematocrit)
Hypophysectomy + Hypophyseal extract (erythropoietic) ↑ in rat
Contopoulos et al B98141/54 C27[illegible]/54 (erythrocyte volume hematocrit percentage)
Hypophysectomy + Hypophyseal anterior lobe hormones Ø + Anesthetic
Tomioka B97632/53 (basophils)
Hypophysectomy + STH in fish
Pickford B97426/54
Hypophysectomy + STH Ø in monkey
Knobil and Greep C5114/55 (hematocrit)

Nitrogen in urine feces ← STH+Insulin
Kinsell C4257/55
Nitrogen in urine ← Cortisone+
Potassium chloride
Kinsell C6133/54
↑ Na in urine
Lichtwitz and Gerocarni C2988/54
Na in urine feces ← STH+Insulin
Kinsell C4257/55
Na in blood urine ← Cortisone+
Potassium chloride
Kinsell C6133/54
↑ Potassium in urine
Lichtwitz and Gerocarni C2988/54
Potassium in urine feces ← STH+Insulin
Kinsell C4257/55
ACTH in blood
Parrott C3165/55 (coma)
ACTH in blood ← Pregnancy
Gray B99980/53
Corticoids in blood
(free and conjugated)
Klein et al C1819/55 (coma)
Corticoids in blood ← ACTH
Eik Nes et al C927/55
(17 hydroxycorticoids)
Ø Corticoids in urine
Hubble C945/55
(17 ketogenic steroids)
Corticoids in urine (oxysteroids) ←
ACTH+Pantothenic acid ↑
Becker et al B97145/54
(without retinopathy)
Corticoids in urine ← Pregnancy
Gray B99581/54 (cortisone cortisol tetrahydrocortisone cpd N_4 N_e)
B99980/53 C4194/54 (fractions)
Corticoids in urine (ketogenic steroids) ←
Insulin
Hubble B99708/54
(insulin resistant)
17 KS in urine (of child)
White C2971/54 (of mother)
17 KS in urine ← STH+Insulin
Kinsell C4257/55
17 KS in urine ← Pregnancy
Gray B99980/53
17 KS in urine ← Insulin
Hubble B99708/54
(insulin resistant)
↑ 17 KS in urine ← Age (newborn)
Bjorklund and Jensen C2182/55
(diabetes of mother)
17 KS in urine ← Glucose
Schrade B96500/53
EEG
Poidevin C6664/55
Hypophysis (histology)
Gerest et al C2180/55 (coma)
Adrenals (histology)
Gerest et al C2180/55 (coma)

↑ Leucocytes ↓ eosinophils
↓ lymphocytes in blood
Siegenthaler C3092/54
(coma)
↑ Erythrocytes in blood
Siegenthaler C3092/54
(coma)
Eosinophils in blood ← ACTH Ø
Becker et al B97145/54
(without retinopathy)
Eosinophils in blood ← ACTH+
Pantothenic acid ↓
Becker et al B97145/54
(without retinopathy)
Eosinophils in blood ← STH+Insulin
Kinsell C4257/55
Blood count ← Glucose
Schrade B96500/53
(neutrophils eosinophils lymphocytes)
Blood pressure ← Hypophysectomy+
DOCA ↑
Luft et al C3574/55
Liver
Mirouze C4294/53
Bones
Fourman C3694/55
↓ Phagocytosis (of leucocytes against tuberculosis bacilli)
Toba C2978/54

Other Pancreatic Diseases

Hyperinsulinism ← ACTH and/or cortisone
Osnes and Thorsen B97071/53
Hyperinsulinism → *Glucose in blood* ←
Cortisol cpd B
Frawley C6218/55 C6233/55
Hyperinsulinism → Glucose in blood ←
ABA (hexamethonium)
Frawley *C6218/55*
Hyperinsulinism → Glucose in blood ←
Fasting
Gastaldi and Fedeli B99742/54
Hyperinsulinism → *Ketones in blood urine* ← Fasting
Gastaldi and Fedeli B99742/54
Hyperinsulinism → Pyruvic acid in blood ←
Cortisol cpd B
Frawley C6218/55 C6233/55
Hyperinsulinism → Urea in
urine ← Fasting ↓
Gastaldi and Fedeli B99742/54
Hyperinsulinism → Eosinophils in blood ←
Fasting ↓
Gastaldi and Fedeli B99742/54
Insulinoma ← ACTH and/or cortisone
del Castillo and Gilchrist C750/53
Pancreatitis ← *Cortisone+Hepatitis* (infectious)
Hoste B96765/53

Pancreatitis ← DOCA + Hepatitis (infectious)
Hoste B96765/53
Pancreatitis → 17 hydroxycorticoids in blood
Engel et al C1913/55
Pancreatitis → Eosinophils in blood
Engel et al C1913/55
Prediabetes → Corticoids in urine
Hoet B98612/54
Steroid diabetes
Frawley C6218/55 (review)
Steroid diabetes → Potassium metabolism
Frawley C6218/55 (discussion)
Steroid diabetes → Phosphorus metabolism
Frawley C6218/55 (discussion)
Steroid diabetes → Pyruvate metabolism
Frawley C6218/55 (discussion)

PINEAL GLAND

Review
Thieblot B98670/54
Pineal gland ← Age in man
Arieti C4258/54 (histology)

BLOOD COUNT

(For earlier pertinent data cf also *Stress* pp 404 441 AROS-1951 pp 267 291 AROS 1952 pp 185 194 AROS 1953 pp 238 251 AROS 1954 pp 425 437)

Generalities
Gordon B98602/54 (review)
Various authors C3411/55 (leucocytic function—review)

Blood Count ← Stimuli

Nerves (CNS)
Polez et al B99785/54
Nerves (electrical stimulation of various brain regions and nerves) in monkey
Porter B98592/54 (eosinophils)
Spinal cord section + Parabiosis in rat
Hall and Hall C5921/55 (erythrocytes hematocrit)
ANS (review)
Mark C910/54
Sympathectomy ↓ in man
Kellermann C4179/55 (lymphocytes)
Sympathectomy ↓ + Hypothalamectomy in dog
Keller et al B99382/54 (eosinophils)
Sympathectomy + Insulin Ø in man
Loyke and Hoobler C5518/54 (eosinophils)
Vagotomy ↑ in man
Kellermann C4179/55 (lymphocytes)
Vagus stimulation in rabbit
Wachholder and Beckmann C3744/53 (lymphocytes neutrophils)
Hypothalamectomy + Pancreatectomy ↓ in dog
Keller et al B99382/54 (eosinophils)
Hypothalamus lesion, in cat
Laqueur et al C6334/55 (eosinophils)
Hypothalamus lesion + ACTH adrenaline in cat
Laquer et al C6334/55 (eosinophils)
Hypothalamus lesion (posterior) + Adrenaline Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus lesion + Trauma in cat
Laquer et al C6334/55 (eosinophils)
Hypothalamus lesion + Trauma, in dog
Hume C6119/54 (eosinophils)
Hypothalamus lesion (posterior) + Trauma Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus lesion + Nerves (emotions)
Hume C6119/54 (eosinophils)
Hypothalamus lesion (posterior) + Histamine Ø in monkey
Porter B98592/54 (eosinophils)
Hypothalamus stimulation in cat
Anand and Dua C6202/55 C6203 (eosinophils)
Hypothalamus extract ↓ in rat
Slusher and Roberts B97423/54 (eosinophils)
Hypophysectomy Ø in rat
Gordon B98602/54 (eosinophils)
Hypophysectomy ↓ in rat
Contopoulos et al B98717/54 (erythrocyte volume hematocrit)
Gordon B98602/54 (erythrocytes erythrocyte fragility leucocytes lymphocytes)
Montuori and Saborida C2211/54 (erythrocytes hematocrit)
Tobias et al B97093/54 (hematocrit)
Hypophysectomy + Hypophyseal extract (erythropoietic) ↑ in rat
Contopoulos et al B98141/54 C272/54 (erythrocyte volume hematocrit percentage)
Hypophysectomy + Hypophyseal anterior lobe hormones Ø + Anesthetic
Tomioka B97632/53 (basophils)
Hypophysectomy + STH in fish
Pickford B974_6/54
Hypophysectomy + STH Ø in monkey
Knobil and Greep C5114/55 (hematocrit)

ACTH+Malnutrition ↑ in man
Zubiran B98239/54 (eosinophils)
ACTH ↓+Ascorbic acid deficiency in guinea pig
Piliero and Gordon C3062/54 (lymphocytes)
ACTH ↑+Ascorbic acid deficiency in guinea pig
Piliero and Gordon C3062/54 (*neutrophils*)
ACTH+Pantothenic acid deficiency ↑ in man
Bean and Hodges B98137/54 (eosinophils)
Bean et al C6777/55 (eosinophils)
ACTH+Pantothenic acid deficiency Ø in rat
Ershoff et al B97962/53 (lymphocytes)
ACTH+Protein deficiency in rat
Aschkenasy and Dray C131/54 (erythrocytes leucocytes lymphocytes eosinophils)
ACTH+Diurnal variations in man
Engel et al C1912/55 (eosinophils)
STH ↑ in dog
Campbell B99964/53 (leucocytes stab cells)
STH in man
Kinsell C4257/55 (eosinophils)
Moore C4988/55 (*eosinophils*)
Sforzini and Negri C3215/54 (erythrocytes leucocytes eosinophils lymphocytes monocytes)
STH Ø in monkey
Knobil and Creep C5114/55 (hematocrit)
STH ↑+Cortisone in dog
Gunderson et al C1629/54 (eosinophils)
STH+Cortisone+Diet fasting in dog
Wilhelmj et al C5841/55 (eosinophils)
STH+Insulin ↓ in dog
Campbell B99964/53 (leucocytes)
STH+Trauma in man
Moore C4988/55 (eosinophils)
STH+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 (leucocytes lymphocytes eosinophils erythrocytes reticulocytes erythroblasts hematocrit)
STH+Protein deficiency in rat
Aschkenasy and Dray C131/53 (erythrocytes leucocytes lymphocytes eosinophils)
GTH+Ovariectomy in cattle
Moberg C6042/55 (leucocytes eosinophils lymphocytes)
Hypophyseal posterior lobe extract ↓
Maneschi and Valli C2053/54 (eosinophils)
Hypophyseal posterior lobe hormones ↑+Adrenalectomy
Tomioka B97632/53 (basophils)
Oxytocin Ø
Maneschi and Valli C2053/54 (eosinophils)
Adrenalectomy in guinea pig
Balduzzi C2020/54 (erythrocyte resistance in vitro)
Adrenalectomy in rat
Chiti and Inzerillo B99729/52 (leucocytes hematocrit)
Shrewsbury and Reinhardt C5956/55 (leucocytes lymphocytes eosinophils)
Adrenalectomy+Adrenaline
Speirs C6121/54 (*eosinophils—discussion*)
Adrenalectomy+Adrenaline in dog
Esselier et al C3206/54 (eosinophils)
Adrenalectomy+Adrenaline ↓ in man
Baker C6122/54 (eosinophils)
Elmadjian C3452/54 (eosinophils)
Laidlaw C6120/54 (eosinophils)
Adrenalectomy+Adrenaline Ø in rat
Louwerens and Smelik B99601/54 (eosinophils)
(Adrenalectomy+Adrenaline) ↑ in rat
Ichikawa B97699/53 (eosinophils)
Adrenalectomy+(Adrenaline+ACE)↓+Splenectomy in rat
Gordon C3421/55 (eosinophils)
Adrenalectomy+Adrenaline+Cortisone in dog
Esselier et al C3206/54 (eosinophils)
Adrenalectomy+Adrenaline↓+Cortisone *in man*
Baker C6118/54 (eosinophils)
Adrenalectomy+Adrenaline+Aldosterone in mouse
Simpson and Tait C3645/55 (*eosinophils*)
Adrenalectomy+Adrenaline Ø+Splenectomy in rat
Gordon C3421/55 (*eosinophils*)
Adrenalectomy+Adrenaline+Cold+NaCl in rat
Heroux C5697/55 (eosinophils)
Adrenalectomy+Adrenaline ↑+Blood (*dog plasma*) *in mouse*
Vogt B97122/54 (eosinophils)
Adrenalectomy+Noradrenaline Ø in man
Elmadjian C3452/54 (eosinophils)
Adrenalectomy+ACE Ø+Splenectomy in rat
Gordon C3421/55 (eosinophils)
Adrenalectomy+Cortisone ↓ in dog
Esselier et al C3206/54 (eosinophils)

Adrenalectomy + Cortisone in rat
Koch C4762/55 (leucocyte degeneration in blood)
Adrenalectomy + Cortisone withdrawal in man
Mendelsohn and Pearson C3575/55 (eosinophils lymphocytes)
Adrenalectomy + Cortisone + Cortisol *in monkey*
Knobil et al B97930/54 (hematocrit)
Adrenalectomy + Cortisone + Ovariectomy in man
Wilson C5568/55 (eosinophils)
Adrenalectomy + Cortisone ↓ in monkey
Knobil et al B97930/54 (hematocrit)
Adrenalectomy + Cortisol + Trauma in dog
Cowie et al C264/54 (eosinophils)
Adrenalectomy + 9 chlorocortisol 9α-fluorocortisol in dog
Swingle et al. C2780/55 (hematocrit erythrocytes)
Adrenalectomy + DOCA in rat
Storck C468/54 (lymphocytes)
Adrenalectomy + DOCA + Electrical stimulation ↓ nerves (emotions) ↓ muscular exercise ↓ ABA (regitine antrenyl) ↓ in dog
Swingle et al B97928/54 (eosinophils)
Adrenalectomy + DOCA withdrawal ↑ in dog
Swingle et al B97928/54 (*erythrocytes hematocrit*)
Adrenalectomy + Aldosterone ↓ in mouse
Gaunt C3646/55 (eosinophils)
Adrenalectomy + Cpd. A ↓ in rat
Storck C468/54 (*lymphocytes*)
Adrenalectomy + Cpd B in rat
Fruhman and Gordon C1902/55
Adrenalectomy + 9α fluorocorticosterone in dog
Swingle et al C2780/55 (hematocrit erythrocytes)
Adrenalectomy + Folliculoids luteoids pregnanedione in rat
Koch C4768/55 (leucocyte degeneration in blood)
(Adrenalectomy + Testis extirpation + Thyroidectomy) ↓ in rat
Contopoulos et al. B98717/54 (erythrocyte volume hematocrit)
Adrenalectomy + Testis extirpation + *Thyroxin* in rat
Shrewsbury and Reinhardt C5956/55 (leucocytes lymphocytes *eosinophils*)
Adrenalectomy + Testis extirpation + Diurnal variations in mouse
Visscher and Halberg C3418/55 (eosinophils)

Adrenalectomy + Testoids in rat
Koch C4768/55 (leucocyte degeneration in blood)
Adrenalectomy + Thyroidectomy in rat
Shrewsbury and Reinhardt C5956/55 (leucocytes lymphocytes eosinophils)
Adrenalectomy + Insulin ↓ in man
Loyke and Hoobler C5518/54 (eosinophils)
Adrenalectomy + Thymus extract
Sary and Porszasz C2133/54 (erythrocytes)
Adrenalectomy + Liver extract ↓ in rat
Kovats et al B99763/54 C493/54 (eosinophils)
Adrenalectomy + Bacterial toxin in mouse
Chedid C622/54 (hematocrit)
Adrenalectomy + *Schistosoma mansoni* ↑ in mouse
de Witt B98340/53 (eosinophils)
Adrenalectomy + Hemolysis (experimentally) in rat
Feldman et al C4542/55 (*leucocytes eosinophils* lymphocytes)
Adrenalectomy + (Hemorrhage + Glucose [i p]) Ø in rat
Peixoto et al. B98980/54 (eosinophils)
Adrenalectomy + (Hemorrhage + Glucose [i p]) ↓ *in rat*
Peixoto et al. B98980/54 (lymphocytes)
Adrenalectomy + (*Hemorrhage* + Glucose [i p]) ↑ in rat
Peixoto et al. B98980/54 (neutrophils)
Adrenalectomy + Cold in rat
Storck C468/54 (lymphocytes)
Adrenalectomy + Low atmospheric pressure ↑ *in rat*
Gordon B98602/54 (eosinophils normal and degenerating)
Adrenalectomy + Serum (of man after amino acid intake) ↓ in rat
Góth et al C3097/53 (eosinophils)
Adrenalectomy + Serum (of fasting man *after amino acid intake in hypocorticoidism*) Ø in rat
Goth et al C3097/53 (eosinophils)
Adrenalectomy + Anesthetic (urethane) ↑ in rat
Hermansky et al C_612/54 (eosinophils lymphocytes)
Adrenalectomy + Blood (dog plasma) ↓ in mouse
Vogt B97122/54 (eosinophils)
Adrenalectomy + Blood (*of patients after* protein or amino acid ingestion) ↓ in rat
Goth et al C3488/55 (*eosinophils*)

Adrenalectomy + Casein hydrolysate ↓ in mouse and rat
Hissink B98322/53 (eosinophils)

Adrenalectomy + Casein hydrolysate ↑ in mouse and rat
Hissink B98322/53 (granulocytes)

Adrenalectomy + Leucine Ø in rat
Goth et al C3488/55 (eosinophils)

Adrenalectomy + Milk in rabbit
Steinberg and Martin B96367/54 (leucocytes)

Adrenalectomy + Parabiosis in rat
Hoelscher B99401/54 2463/55 (erythrocytes hematocrit)

Adrenal demedullation + Adrenal transplant in spleen + *Adrenaline in rat*
Kovacs and Jacobovits C6531/54 (eosinophils)

Medulloids ↑ in man and rabbit
Tomioka B97631/52 (basophils)

Adrenaline in dog
Hume C6119/54 (eosinophils)

Adrenaline in man
Bilger et al B97946/54 (lymphocytes)
Mark C910/54 (shape and movement of leucocytes)
Tyler et al C3648/55 (leucocytes lymphocytes eosinophils)

Adrenaline ↓ in man
Essellier et al C3206/54 (eosinophils)
Hunter et al C4526/55 (eosinophils)
Nelson C899/53 (eosinophils)

Adrenaline ↑ in man
Bilger et al B97946/54 (leucocytes)
Nelson C899/53 (leucocytes)

Adrenaline ↑ in rabbit
Sen et al B99177/53 (thrombocytes)

Adrenaline ↓ in rat
Peixoto and Dias C3517/52 (eosinophils)

Adrenaline (long term pretreatment) + Adrenaline Ø in rat
Bozović and Rabadzija C522/53 (eosinophils)

Adrenaline ↓ + Cortisone in man
Essellier et al C3206/54 (eosinophils)
Labhart and Spengler B98459/53 (eosinophils)

Adrenaline ↑ + Cortisone in man
Tyler et al C3648/55 (leucocytes)

Adrenaline + Folliculoids Ø in rat
Louwerens and Smelik B99601/54 (eosinophils)

Adrenaline + Thyroidectomy ↑ in rat
Carter B98140/54 (eosinophils)

Adrenaline + Thyroidectomy + Thyroxin ↓ in rat
Carter B98140/54 (eosinophils)

Adrenaline + Thyroxin Ø in rat
Carter B98140/54 (eosinophils)

Adrenaline Ø + Splenectomy in rabbit
Sen et al B99177/53 (thrombocytes)

Adrenaline + Age (newborn) in man
Crassi and Maneschi C4188/54 (eosinophils)

Adrenaline Ø + Leucopheresis in dog
Lawrence C3400/55 (leucocytes)

Adrenaline (long term) + Cold Ø hypoxia Ø in rat
Bozović and Rabadžija C522/53 (eosinophils)

Adrenaline + ABA (various) Ø in man
Bernsmeier and Becker B98010/53 (leucocytes)

Adrenaline + Anesthetic (barbiturate) Ø in rat
Nakamura B98632/53 (lymphocytes)

Adrenaline + Antibiotic in rat
Dickson et al C3982/54 (*eosinophils*)

Adrenaline + Fish solubles in rat
Dickson et al C3982/54 (eosinophils)

Adrenaline (long term) + Formalin Ø in rat
Bozović and Rabadzija C522/53 (eosinophils)

Adrenaline + Vitamin B_1 ↑ in rat
Kemeny et al C4646/54 (eosinophils)

Adrenaline + Fasting in man
Castaldi and Fedeli B97769/53 (eosinophils)

Adrenaline + Pantothenic acid deficiency Ø in rat
Ershoff et al B97962/53 (lymphocytes)

Adrenaline ↓ + Parabiosis in dog
Malmejac and Gross B96901/53 (lymphocytes)

Noradrenaline in man
Tyler et al C3648/55 (leucocytes lymphocytes eosinophils)

Adrenaline derivates ↓ in man
Camerada and Leo C1486/53 C1487/53 (eosinophils)

Adrenaline derivatives + ABA (antihistamine) ↑ in man
Camerada and Leo C1486/53 (eosinophils)
Leo et al C1515/52 (eosinophils)

ACE Ø + Age (newborn) in rat
Contopoulos et al C1899/55 (erythrocyte volume hematocrit)

ACE + Intestinal obstruction (experimental) in dog
Testini B99986/ND (hematocrit)

Corticoids (discussion)
Swingle and Kleinberg C3433/55 (*eosinophils*)

Corticoids ↑ in man and rabbit
Tomioka B97631/52 (basophils)
Corticoids in rat
Gordon C3421/55
(leucocytes lymphocytes eosinophils—review)
Cortisone
Gross C4613/54 (eosinophils lymphocytes—discussion)
C4614/54 (eosinophils—discussion)
Cortisone in fowl
Greeley C6617/55 (leucocytes)
Cortisone (long term) Ø in man
Fischer and Lund B97600/54 (thrombocytes)
Cortisone (free or acetate per os or i m) in man
Nelson C899/53 (leucocytes lymphocytes eosinophils)
Cortisone in mouse
Einbinder et al. C540/54 (hematocrit)
Morsiani and Lucci C618/54 (leucocytes lymphocytes)
C619/54 ("histoid endothelia in blood)
Cortisone in pheasant
Greeley C6617/55 (leucocytes)
Cortisone in rabbit
Bracali and Spigolon C11/54 (lymphocytes)
Cortisone ↑ in rabbit
von Mundy C2697/54 (eosinophils in mesenteric venous blood)
Cortisone Ø in rat
Bounameaux and van Cauwenberge C1981/54 (thrombocytes)
Cortisone+Ovariectomy in rat
Koch C4768/55 (leucocyte degeneration in blood)
Cortisone Ø+*Ascaris* in cat
Deschiens B98945/53 (eosinophils)
Cortisone Ø+Fasciola hepatica extract in guinea pig
Deschiens B98945/53 (eosinophils)
Cortisone+*Taenia* in cat
Deschiens B98945/53 (eosinophils)
Cortisone Ø+Worms (*Strongyloides*) in man
Aron C327/53 (eosinophils)
Cortisone Ø+Hemorrhage in dog
Frank et al C4138/55 (eosinophils)
Cortisone ↑+Hemorrhage in rabbit
Bounameaux C1979/54 (erythrocytes thrombocytes)
Cortisone+Serum (hemolytic immune) in guinea pig
Wasastjerna and Desy C1076/54 (erythrocytes reticulocytes)
Cortisone+Amino acid in man
Ehel and Haney B99555/54 (eosinophils)

Cortisone+Ethyl alcohol ↑ in man
Laves C2733/54 (eosinophils)
Cortisone ↓+Pepper guinea pig
Deschiens B98945/53 (eosinophils)
Cortisone ↓+Phenylhydrazine
Singer B97863/54 (reticulocytes)
Cortisone ↑+Phenylhydrazine
Singer B97863/54 (erythrocytes)
Cortisone+Pyrogen, in rabbit
Wood et al. C3468/54 (leucocytes)
Cortisone+Serotonin ↓ in mouse
Halberg C536/54 (eosinophils)
Halberg et al C1650/54 (eosinophils)
Visscher and Halberg C3418/55 (eosinophils)
Cortisone+Diet in dog
Wilhelmj et al C5976/55 (eosinophils)
Cortisone ↓+Protein deficiency in rat
Aschkenasy C3100/54 (erythrocytes leucocytes lymphocytes eosinophils)
Cortisone+Protein deficiency ↓ in rat
Aschkenasy C1988/54 (lymphocytes erythrocytes)
Cortisol, in man
Conn C1719/52 (eosinophils hematocrit)
Goldfien et al C3960/55 (eosinophils)
Cortisol (i v) ↓ in man
Knight et al C1814/55 (eosinophils)
Cortisol (free or acetate per os or i m) in man
Nelson C899/53 (leucocytes *lymphocytes eosinophils)*
Cortisol (percutaneously) in man
Smith C6237/55 (eosinophils)
Cortisol+Glucose in man
Frawley C6_18/55 C6_33/55 (eosinophils)
Cortisol (locally into inflamed area)+Inflammation+Leucocytosis promoting factor in dog
Menkin C3425/55 (leucocytes)
9 fluorocortisol, in man
Goldfien et al. C3960/55 (eosinophils)
Sala et al C4818/55 (eosinophils)
9 fluoro ortisol+Diseases (various) in man
Ballabio et al C4816/55 (erythrocytes leucocytes)
Δ cortisone in man
Pechet C4043/55 (leucocytes)
Robinson C5639/55 (eosinophils)
Sala et al. C4818/55 (eosinophils)
Δ cortisone in rat
Perlman and Tolksdorf C5281/55 (eosinophils)

Adrenalectomy+Casein hydrolysate ↓ in mouse and rat
Hissink B98322/53 (eosinophils)
Adrenalectomy+Casein hydrolysate ↑ in mouse and rat
Hissink B98322/53 (granulocytes)
Adrenalectomy+Leucine Ø in rat
Goth et al C3488/55 (eosinophils)
Adrenalectomy+Milk in rabbit
Steinberg and Martin B96367/54 (leucocytes)
Adrenalectomy+Parabiosis in rat
Hoelscher B99401/54 2463/55 (erythrocytes hematocrit)
Adrenal demedullation+Adrenal transplant in spleen+Adrenaline in rat
Kovács and Jacobovits C6531/54 (eosinophils)
Medulloids ↑ in man and rabbit
Tomioka B97631/52 (basophils)
Adrenaline in dog
Hume C6119/54 (eosinophils)
Adrenaline in man
Bilger et al B97946/54 (lymphocytes)
Mark C910/54 (shape and movement of leucocytes)
Tyler et al C3648/55 (leucocytes lymphocytes eosinophils)
Adrenaline ↓ in man
Essellier et al C3206/54 (eosinophils)
Hunter et al C4526/55 (eosinophils)
Nelson C899/53 (eosinophils)
Adrenaline ↑ in man
Bilger et al B97946/54 (leucocytes)
Nelson C899/53 (leucocytes)
Adrenaline ↑ in rabbit
Sen et al B99177/53 (thrombocytes)
Adrenaline ↓ in rat
Peixoto and Dias C3517/52 (eosinophils)
Adrenaline (long term pretreatment)+Adrenaline Ø in rat
Bozović and Rabadzija C522/53 (*eosinophils*)
Adrenaline ↓+Cortisone in man
Essellier et al C3206/54 (eosinophils)
Labhart and Spengler B98459/53 (eosinophils)
Adrenaline ↑+Cortisone in man
Tyler et al C3648/55 (leucocytes)
Adrenaline+Folliculoids Ø in rat
Louwerens and Smelik *B99601/54* (eosinophils)
Adrenaline+Thyroidectomy ↑ in rat
Carter B98140/54 (eosinophils)
Adrenaline+*Thyroidectomy*+Thyroxin ↓ in rat
Carter B98140/54 (eosinophils)
Adrenaline+Thyroxin Ø in rat
Carter B98140/54 (eosinophils)
Adrenaline Ø+Splenectomy in rabbit
Sen et al B99177/53 (thrombocytes)
Adrenaline+Age (newborn) in man
Grassi and Maneschi C4188/54 (eosinophils)
Adrenaline Ø+Leucopheresis in dog
Lawrence C3400/55 (leucocytes)
Adrenaline (long term)+Cold Ø hypoxia Ø in rat
Bozović and Rabadžija C522/53 (eosinophils)
Adrenaline+ABA (various) Ø in man
Bernsmeier and Becker B98010/53 (leucocytes)
Adrenaline+Anesthetic (barbiturate) Ø in rat
Nakamura B98632/53 (lymphocytes)
Adrenaline+Antibiotic in rat
Dickson et al C3982/54 (eosinophils)
Adrenaline+Fish solubles in rat
Dickson et al C3982/54 (eosinophils)
Adrenaline (long term)+Formalin Ø in rat
Bozović and Rabadzija C522/53 (eosinophils)
Adrenaline+Vitamin B_1 ↑ in rat
Kemeny et al C4646/54 (eosinophils)
Adrenaline+Fasting in man
Gastaldi and Fedeli B97769/53 (eosinophils)
Adrenaline+Pantothenic acid deficiency Ø in rat
Ershoff et al B97962/53 (lymphocytes)
Adrenaline ↓+Parabiosis in dog
Malmejac and Gross B96901/53 (lymphocytes)
Noradrenaline in man
Tyler et al C3648/55 (leucocytes lymphocytes eosinophils)
Adrenaline derivates ↓ in man
Camerada and *Leo C1486/53* C1487/53 (eosinophils)
Adrenaline derivatives+ABA (antihistamine) ↑ in man
Camerada and Leo C1486/53 (eosinophils)
Leo et al C1515/52 (eosinophils)
ACE Ø+Age (newborn) in rat
Contopoulos et al C1899/55 (*erythrocyte volume hematocrit*)
ACE+Intestinal obstruction (experimental) in dog
Testini B99986/ND (hematocrit)
Corticoids (discussion)
Swingle and Kleinberg C3433/55 (eosinophils)

Testis extirpation Ø+Trauma nerves
(immobilization) in dog
Ganong and Junker C733/55
(eosinophils)

Testis extirpation+Protein deficiency
in rat
Aschkenasy C1988/54
(lymphocytes)

Testoids in mouse
Lavenda and Wong B99390/54
(erythrocytes leucocytes)

Testoids in rat
Koch C4768/55 (leucocyte
degeneration in blood)

(Testoids+Thyroxin) Ø+Age (newborn)
in rat
Contopoulos et al C1899/55
(erythrocyte volume hematocrit)

Testoids ↑+Trauma in man
Loddi and Moggi C1280/53
(eosinophils)

Testoids+Ionizing rays in mouse
Gardner C4372/55
(leukemogenesis)

Testoids+Casein+Protein deficiency
in rat
Aschkenasy and Dray C1990/54
(leucocytes lymphocytes
eosinophils erythrocytes
reticulocytes erythroblasts
hematocrit)

Testoids+Protein deficiency in rat
Aschkenasy C1988/54 C3100/54
(lymphocytes eosinophils
erythrocytes)
Aschkenasy and Dray C131/54
(erythrocytes leucocytes
lymphocytes eosinophils)

Pregnanedione in rat
Koch C4768/55
(leucocyte degeneration in blood)

Thyroidectomy+Protein deficiency in rat
Aschkenasy C1988/54
(lymphocytes)

Thyroxin ↑ in man and rabbit
Tomioka B97651/52 (basophils)

Thyroxin in rat
Shrewsbury and Reinhardt C5956/55
(leucocytes lymphocytes
eosinophils)

Thyroxin+Vaccine in rabbit
Chiti and Inzerillo B99731/53

Thyroxin+Casein+Protein deficiency
in rat
Aschkenasy and Dray C1990/54
(leucocytes lymphocytes
eosinophils erythrocytes
reticulocytes erythroblasts
hematocrit)

Thyroxin+Protein deficiency in rat
Aschkenasy C1988/54
(lymphocytes) C3100/54 (leucocytes lymphocytes
erythrocytes)
Aschkenasy and Dray C131/53
(erythrocytes leucocytes
lymphocytes eosinophils)

Pancreatectomy ↓ in dog
Yosioka B98065/54
(eosinophils)

Insulin in man
Knick C5078/54
(erythrocytes leucocytes)
C5972/54 (leucocytes)
Noguera and Marquez C4656/54
(lymphocytes)

Insulin ↓ in man
Froesch et al C125/54
(eosinophils)
Knick C3972/54 (eosinophils)
Loyke and Hoobler C5518/54
(eosinophils)
Noguera and Marquez C4656/54
(eosinophils)
Staehelin et al C4464/55
(eosinophils)

Glucagon in rat
Cavallero et al C1409/5_
(eosinophils lymphocytes—
discussion)

Thymus extract+Vaccine in rabbit
Inzerillo and Chiti B99743/53
(leucocytes hematocrit)

Splenectomy ↑ in man
Esselier et al C1177/55
(leucocytes eosinophils)

Splenectomy Ø+Trauma in man
Sevitt C5627/55
(eosinophils)

Nephrectomy+Renin+NaCl in rat
Masson et al C5123/55
(hematocrit)

Inflammation (after burns cold)
in rabbit
Moon and Tar hakovec C428_/54
(leucocytes)

Inflammation (anaphylactoid after egg
white i p) Ø in rat
van Cauwenberge et al C1974/53
(eosinophils)

Age in cattle
Moberg C6042/55
(leucocytes lymphocytes
eosinophils monocytes)

Age in guinea pig
Schweizer C6322/55
(eosinophils)

Age (newborn) in man
Grassi and Maneschi C4188/54
(eosinophils)

Δ¹ ⁴ cortisone + Diseases (various) in man
Ballabio et al C4816/55
(erythrocytes leucocytes)
Δ cortisol in man
Pechet C4043/55 (leucocytes eosinophils lymphocytes)
Δ cortisol in rat
Perlman and Tolksdorf C5281/55
(eosinophils)
DOCA + Intestinal obstruction (experimental) in dog
Testini B99987/52 (hematocrit)
Aldosterone ↓ in man
Mach and Fabre C3654/55
(eosinophils)
Thorn et al C6249/55
(eosinophils)
Cpd A ↑ in guinea pig
Yoffey et al B97950/54
(lymphocytes)
Cpd A Ø in man
Doolan et al C1344/55 (eosinophils)
Sex in guinea pig
Schweizer C6322/55
(leucocytes mononuclear cells)
Sex + Age + Diurnal variations in mouse
Visscher and Halberg C5418/55
(eosinophils)
Ovariectomy + Folliculoids + Luteoids in cattle
Moberg C6042/55 (leucocytes eosinophils lymphocytes)
Ovariectomy + Luteoids in cattle
Moberg C6042/55 (leucocytes eosinophils lymphocytes)
Ovariectomy + Luteoids in rat
Koch C4768/55
(leucocyte degeneration in blood)
Ovariectomy + Estrus in rat
Koch C4768/55
(leucocyte degeneration in blood)
Ovariectomy + Testoids in rat
Koch C4768/55
(leucocyte degeneration in blood)
Ovariectomy + Vitamin E in cattle
Moberg C6042/55
(leucocytes eosinophils lymphocytes)
Ovariectomy + Starvation in mouse
Visscher and Halberg 3418/55
(eosinophils)
Folliculoids Ø in mouse
Lavenda and Wong B99390/54
(erythrocytes)
Folliculoids ↓ in mouse
Lavenda and Wong B99390/54
(leucocytes)
Folliculoids in rat
Koch C4768/55 (leucocyte degeneration in blood)
Folliculoids ↓ in sheep
Clegg and Cole C158/54
(eosinophils)

Folliculoids + Testis extirpation in rat
Koch C4768/55 (leucocyte degeneration in blood)
Folliculoids ↑ + Trauma in rat
Louwerens and Smelik B99601/54
(eosinophils)
Folliculoids ↑ + Hemorrhage in rat
Louwerens C1411/53 (eosinophils)
Folliculoids + Ionizing rays in mouse
Gardner C4372/55
(leukemogenesis)
Folliculoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
(leucocytes lymphocytes eosinophils erythrocytes reticulocytes erythroblasts hematocrit)
Folliculoids + Protein deficiency in rat
Aschkenasy and Dray C131/53
(erythrocytes leucocytes lymphocytes eosinophils)
Luteoids (discussion)
Colomer C3948/54
(erythrocytes leucocytes)
Luteoids in rat
Koch C4768/55 (leucocyte degeneration in blood)
Sex (♀) ↑ in guinea pig
Schweizer C6322/55 (eosinophils)
Menstruation ↓ in man
Thomas B97038/53 (eosinophils)
Estrus in cattle
Moberg B98817/53 B98818/ND
C6042/55 (leucocytes eosinophils lymphocytes)
Pregnancy in cattle
Moberg C6042/55 (leucocytes eosinophils lymphocytes)
Pregnancy in man
Gemzell C4442/55 (eosinophils)
Pregnancy (prepartum period) ↓ in man
Schoen and Schnall B98373/54
(eosinophils)
Delivery in cattle
Moberg C6042/55 (leucocytes eosinophils lymphocytes)
Puerperium ↑ in man
Schoen and Schnall B98373/54
(eosinophils)
Testis extirpation + Testis extract ↓ + *Hemorrhage in rabbit*
Calaresu and Fraghi C3099/54
(erythrocytes)
Testis extirpation + Testoids ↑ in rat
Bowman and Strafford B99848/54
(erythrocytes)
Testis extirpation + Thyroxin in rat
Shrewsbury and Reinhardt C5956/55
(leucocytes lymphocytes eosinophils)

Cold in man
Kuhl et al C5356/55
(leucocytes lymphocytes eosinophils)
Thorn et al C5668/55
(eosinophils)
Cold in rabbit
Moon and Tarshakovec C4282/54
(leucocytes)
Cold ↓ in rat
Storck C468/54 (lymphocytes)
Cold ↓+Histamine (long term) in rat
Bozović and Rabadzija C522/53
(eosinophils)
Hypothermia in dog
Villalobos et al C6285/55
(leucocytes erythrocytes hematocrit thrombocytes)
Hibernation in hedgehog
Suomalainen C852/53
(leucocytes eosinophils lymphocytes)
Hibernation (artificial) ↑ in dog
Juvenelle et al C2689/53
(hematocrit)
Hibernation (artificial) ↑ in man
Laborit B97702/53
(leucocytes)
Ionizing rays (dorsal spine) ↓
Foti and Deak C4882/54
(eosinophils)
Ionizing rays ↑ in dog
Savitsky C5966/55
(leucocyte adhesiveness)
Ionizing rays in guinea pig
Brace et al C1015/54
(lymphocytes macropolycytes)
Ionizing rays ↑ in guinea pig
Savitsky C5966/55
(leucocyte adhesiveness)
Ionizing rays (atomic bomb) in man
Kikuchi and Wakisaka B96434/52
(leucocytes eosinophils)
Koyama B97640/52 (leucocytes)
Ionizing rays (thermal neutron) in mouse
Upton et al B99035/54
(leucocytes)
Ionizing rays in rat
Jovanovic C1671/53 (lymphocytes)
Ionizing rays in various animals
Cronkite and Brecher C5417/55
(leucocytes—review)
Ultraviolet light in mouse
Greb B97981/53 (erythrocytes)
Electroshock in man
Kurosaka B978 8/5_
(fibrinolysis blood count after addition of thrombin)

Nerves
Ikezaki B97857/52
(motility type number of leucocytes—discussion)
Moeschlin B97076/54 (review)
Wenzel C1350/54
(eosinophils—review)
Nerves (ultrasound) in guinea pig
Introna C4811/53 (erythrocytes leucocytes eosinophils basophils)
Nerves (emotions) in man
Halmosh C5854/53 (leucocytes)
Persky C1690/53 (eosinophils)
Thorn et al C5668/55
(eosinophils—discussion)
Nerves (psychomotor stress) in man
Elmadjian C3452/54 (eosinophils)
Nerves (water i c) in man
Leo et al C1514/52 (eosinophils)
Nerves (emotions)+Bellergal in man
Halmosh C5854/53 (leucocytes)
Nerves (flying)+Diurnal variations
in man
Murphy et al C5680/54
(eosinophils)
Nerves (psyche)+Diurnal variations
in man
Sollberger B99193/54
(eosinophils—discussion)
Nerves (light)+Diurnal variations
in mouse
Halberg et al C531/54
(eosinophils)
Visscher and Halberg C3418/55
(eosinophils)
Nerves (psyche)+Season in man
Sollberger B99193/54
(eosinophils discusssion)
Cysternography ↓ in man
Salomone C1850/54
(eosinophils lymphocytes)
Cysternography ↑ in man
Salomone C1850/54 (leucocytes)
Muscular exercise in man
Bilger et al B97946/54
(eosinophils leucocytes)
Delanne et al C41/54
(eosinophils lymphocytes erythrocytes hematocrit)
Prader et al C5655/55
(eosinophils)
Thorn et al C5668/55
(eosinophils—discussion)
Muscular exercise ↓ in man
Bilger et al B97946/54
(monocytes basophils)
Firmiani C5523/53 (eosinophils)
Staehelin et al C4464/55
(eosinophils)

Age+Diseases (various) in man
Engel et al C1913/55
(eosinophils)
Age (newborn)+Hypoxia Ø in rat
Contopoulos et al B98142/54
(hematocrit red cell volume)
Age (infantile)+Protein deficiency ↓
Fujiwara B97669/52 (neutrophils)
Age (infantile)+Protein deficiency ↑
Fujiwara B97669/52 (lymphocytes)
Heredity+Nerves (emotions) in man
Halmosh C5854/53
(leucocytes)

Blood Count ← Stressors

Diseases (various)+Muscular exercise in man
Koster et al C4681/54
(leucocytes eosinophils)
Hemolysis (experimentally) in rat
Feldman et al C4542/55
(leucocytes eosinophils lymphocytes)
Hemolysis (experimentally)+Trauma formalin in rat
Feldman et al C4542/55
(leucocytes eosinophils lymphocytes)
Leukemia (experimental)+Phenylbutazone ↓ in fowl
Stern and Misirlija C4172/55
(leucocytes)
Tumors (various) in man
Grewe and Schlütter B96701/54
(eosinophils)
Trauma ↓ in man
Feldthusen and Lassen B99495/54
(eosinophils)
Franksson and Gemzell C2010/53
C2130/53 (eosinophils)
Gemzell C4442/55
(eosinophils)
Goldman et al C129/53
(eosinophils)
Howard C2454/54 (eosinophils)
Nicholas et al B98539/54
(eosinophils)
Palomba and Fresu C4653/54
(eosinophils)
Palomba et al *C6613/52*
(eosinophils)
Sas and Boros C2126/54
(eosinophils)
Trauma (tourniquet) in mouse
Millican C1595/54 (erythrocytes)
Trauma+ABA (hexamethonium) ↑ in rat
Louwerens and Smelik B99601/54
(eosinophils)
Trauma+Anesthetic (barbiturate) ↑ in rat
Louwerens and Smelik B99601/54
(eosinophils)

Trauma+Liquorice in rabbit
Itô et al C3305/54
(leucocytes lymphocytes *eosinophils*)
Trauma+*Diurnal variations in mouse*
Visscher and Halberg C3418/55
(eosinophils)
Eye extirpation+Diurnal variations in mouse
Halberg et al C531/54
(eosinophils)
Visscher and Halberg C3418/55
(eosinophils)
Electrotrauma in guinea pig
Sanfilippo and Sgrò C1995/53
(hematocrit)
Hemorrhage ↓ in rat
Louwerens C1411/53 (eosinophils)
Hemorrhage Ø+Anesthetic (barbiturate) in rat
Nakamura B98632/53
(lymphocytes)
Hemorrhage+Anesthetic (barbiturate)+Glucose (i p) in rat
Peixoto et al B98980/54
(neutrophils eosinophils lymphocytes)
Hemorrhage+Glucose (i p) in rat
Peixoto et al B98980/54
(eosinophils lymphocytes neutrophils)
Burns ↓ in man
Cray et al C1309/54
(eosinophils)
Sevitt (C3627/55 (eosinophils)
Heat Ø in cattle
Rusoff et al. C3259/55
(hematocrit)
Heat ↓ in dog
Baker and Rovit B99151/54
(red cell volume)
Heat ↑ in dog
Warner and Dobson B99395/54
(leucocytes)
Heat stroke Ø in man
Calogerà B99373/53 (erythrocytes)
Heat stroke ↓ in man
Calogerà B99373/53
(leucocytes)
Heat ↓ in rat
Langley and Kilgore C4136/55
(eosinophils)
Heat+Carbon dioxide ↑ in rat
Langley and Kilgore C4136/55
(eosinophils)
Cold in hedgehog
Suomalainen C852/53
(leucocytes eosinophils lymphocytes)

Carbohydrates Ø+Fasting in dog
Kramar et al. B99000/54
(eosinophils)
Carbon dioxide in guinea pig
King and Schaefer C2301/54
(eosinophils lymphocytes)
Schaefer C5148/55
(eosinophils lymphocytes)
Schaefer and King C1651/54
(eosinophils lymphocytes)
Carbon dioxide in rabbit
Wachholder and Beckman C3744/53
(lymphocytes neutrophils)
Carbon dioxide in rat
King and Schaefer C1636/54
C2301/54 (eosinophils
lymphocytes)
Langley and Kilgore C4136/55
(eosinophils)
Schaefer and King C1651/54
(eosinophils lymphocytes)
Carbon monoxide ↓ in man
Essellier et al. C3207/54
(eosinophils lymphocytes)
Carbon monoxide ↑ in man
Essellier et al. C3207/54
(leucocytes)
Cardiazol ↑ in man
Swensson B99223/53 (leucocytes)
Cocarboxylase Ø in man
Larizza et al. C3786/54
(leucocytes lymphocytes)
Cocarboxylase ↓ in man
Larizza et al. C3786/54
(eosinophils)
Colchicine ↓ in rat
Mugler B96592/54 (eosinophils)
Cystamine Ø cysteamine Ø cysteine Ø
in rat
van Cauwenberge et al. B99638/54
(eosinophils)
Dye (Congo red) Ø
Pellegrini et al. B98477/53
(eosinophils)
Egg white (boiled) ↓ in man
Goth et al. C3097/53 C3488/55
(eosinophils)
Ethyl alcohol ↑ in man
Laves C2733/54 (eosinophils)
Formalin in rat
Hermansky et al. C2747/54
(eosinophils)
Formalin ↓+Histamine (long term) in rat
Bozović and Rabadzija C522/53
(eosinophils)
Glucose ↓ in man
Schrade B96500/53
(eosinophils lymphocytes)
Glucose ↑ in man
Schrade B96500/53 (neutrophils)
Glucose (hypertonic i.v.) ↓ in rat
Hermansky et al. C2747/54
(eosinophils)
Glycine ↓ in man
Goth et al. C3097/53 (eosinophils)
Glycine Ø in rat
Goth et al. C3488/55 (eosinophils)
Gold ↑ in man
Bjorkman B96536/53
(eosinophils)
Heparin ↓ in rabbit
de Matteis C2016/54
(eosinophils)
Histamine ↓ in man
Camerada and Leo C1487/53
(eosinophils)
Camerada et al. C1511/52
C1513/52 (eosinophils)
Histamine (long term pretreatment)+
Histamine Ø in rat
Bozović and Rabadzija C522/53
(eosinophils)
Histidine in rat
Goth et al. C3097/53 C3488/55
(eosinophils)
Hydroxykynurenine Ø in mouse
Halberg C556/54 (eosinophils)
Isoleucine Ø in rat
Goth et al. C3488/55
(eosinophils)
Leucine ↓ in man
Goth et al. C3097/53
(eosinophils)
Leucine ↓ in rat
Goth et al. C3097/53 C3488/55
(eosinophils)
Leukerethin in man
Bowing C5036/55 (leucocytes
eosinophils lymphocytes
monocytes)
Lysine ↓ in rat
Goth et al. C3097/53
(eosinophils)
Methionine ↓ in rat
Goth et al. C3097/53 C3488/55
(eosinophils)
NaCl ↓ in rat
Mugler B96592/54 (eosinophils)
NaCl (hypertonic) in rat
Hermansky et al. C2747/54
(eosinophils)
Pantothenic acid, in man
Olivi and Cheli C3978/53
(eosinophils)
Paraoxypropiophenone ↑
Larizza and Chirico B97999/53
(leucocytes reticulocytes)
Paraoxypropiophenone ↓ in guinea pig
Cicala and Pugliese Carratelli
B99796/53 (lymphocytes)

Muscular exercise ↑ in man
Delanne B99583/54 (erythrocyte diameter)
Delanne et al C41/54 (leucocytes)
Nishimaru et al B97609/52 (leucocytes lymphocytes)
Muscular exercise + Hypoxia in man
Matthews et al C6054/55 (eosinophils lymphocytes)
Muscular exercise + Anesthetic (barbiturate) in man
Mark C910/54 (shape and movement of leucocytes)
Hypoxia in man
Kurosaka B97838/52 (blood count after addition of thrombin)
Thorn et al C5668/55 (eosinophils)
Hypoxia + Decompression in man
Koller et al B96680/54 (eosinophils leucocytes thrombocytes)
Hypoxia ↓ + Histamine (long term) in rat
Božović and Rabadzija C522/53 (eosinophils)
Atmospheric pressure in guinea pig
Frada and Cali C1043/53 (hematocrit)
Antigen (typhoid) ↓ in man
Conn et al B98605/54 (eosinophils)
Jarisch Herxheimer reaction in man
Pastinszky et al C6208/55 (leucocytes eosinophils lymphocytes)
Vaccine (smallpox) ↓ in man
Rumke B97585/54 (eosinophils)
Vaccine (typhoid) ↓ in man
Solomon et al B99056/54 (lymphocytes eosinophils)
Vaccine (typhoid) ↑ in man
Solomon et al B99056/54 (polymorphonuclear leucocytes)
Vaccine (smallpox) + Ascorbic acid ↑ in man
Rumke B97585/54 (eosinophils)
ABA (various) ↓ in rat
Nakamura B98633/53 (lymphocytes)
ABA (various) + Formalin in rat
Nakamura B98633/53 (lymphocytes)
ABA + Histamine in rat
Semonsen and Sawyer C2723/54 (eosinophils)
ABA (antihistamine) + Histamine in man
Camerada and Leo C1487/53 (eosinophils)
Camerada et al B1511/52 (eosinophils)
Amidopyrin ↓ in man
Balduini and Piccinelli B96803/53 (eosinophils)
Amino acid ↓ in man
Goth et al C3488/55 (eosinophils)
Anesthetic (barbiturate) ↓ in dog
Waud B98897/54 (hematocrit viscosity specific gravity of blood)
Anesthetic (barbiturate) ↓ in man
Essellier et al C3207/54 (eosinophils lymphocytes)
Anesthetic (barbiturate) ↑ in man
Essellier et al C3207/54 (leucocytes)
Anesthesia (locally to carotid sinus) ↓ in man
Wojtek C1993/54 (eosinophils)
Anesthetic ↓ in mouse
Chutna C752/54 (leucocytes)
Anesthetic (urethane) ↓ in rat
Hermansky et al C2612/54 (leucocytes lymphocytes eosinophils)
Anesthetic (barbiturate) + Formalin in rat
Hermansky et al C2612/54 (eosinophils)
Anesthetic (barbiturate) + Formalin Ø in rat
Nakamura B98632/53 (lymphocytes)
Anesthetic (urethane barbiturate) + Glucose in rat
Hermansky et al C2612/54 (leucocytes lymphecytes eosinophils)
Anesthetic (barbiturate) Ø + Glucose (hypertonic i v) in rat
Hermansky et al C2747/54 (eosinophils)
Anesthetic (barbiturate) + NaCl (hypertonic) in rat
Hermansky et al C2747/54 (eosinophils)
Anesthetic (barbiturate) + Diurnal variations in rat
Teixoto and Dias C3517/52 (eosinophils)
Antimitotic in mouse
Morsiani and Lucci C618/54 (leucocytes lymphocytes)
Ascorbic acid ↑ + Ascorbic acid deficiency in guinea pig
Fihero and Gordon C3062/54 (eosinophils)
ATP ↓ in man
Olivi and Frodi C2080/54 (eosinophils)
Bufotenin ↓ in mouse
Halberg C5?6/54 (eosinophils)

Kaine et al. C1534/55
(eosinophils)
Visscher and Halberg C3418/55
(eosinophils)
Diurnal variations in mouse
Halberg et al. C2772/55
(eosinophils)
Diurnal variations in rat
Peixoto and Dias C3517/52
(eosinophils)
Season in hedgehog
Suomalainen C852/53 (leucocytes eosinophils lymphocytes)
Balneologic conditions in man
Nonobe and Nonobe B97638/52
(eosinophils)
Nonobe et al. B97658/52
(*eosinophils*)
Santenoise et al. C842/54
(*leucocytes eosinophils lymphocytes*)
Phasic variation *in rabbit*
Wachholder and Beckmann C3744/53
(*lymphocytes neutrophils*)
Posture in ape
Britton C5059/55 (*eosinophils*)
Stress in dog
Malmejac et al C3811/54
(lymphocytes)

BLOOD DISEASES

Anemias

Pathog*enesis*
Aschkenasy C1988/54
(hormones vitamines diet review)
C1989/54 (hypophysis thyroid)

Anemias ← Various

Aplastic ← ACTH and/or cortisone
Bonham Carter et al C633/54
Pickard and Rosenblatt B97097/54
(chloromycetin)
Aplastic Ø → *17 hydroxycorticoids in* blood ← ACTH
Eik Nes et al. C927/55
Congenital ← Cortisone
Zuelzer C632/54
Fanconi s anemia ← ACTH
Kessel and Cohen B98417/53
Hemolytic ← ACTH and/or cortisone
Anonymous B98498/54
(Marchiafava Micheli syndrome)
Charmot et al C4766/53
Croizat et al C2959/54
Elliott and Hyman B99883/54
Etienne Martin et al C4706/54
(Marchiafava Micheli syndrome)
Forster and Moeschlin C636/54
(acquired)
de Gruchy C4705/54
MacLean and Parnell C4267/55
Moeschlin et al C6154/54
Rosenthal C6705/54 (acquired)
Rosenthal et al C2752/55
(*malignant* lymphocytic disease—discussion)
Schwartz et al C6141/54
(after phenylbutazone)
Tischendorf and *Muller B99211/54*
Zuelzer C632/54 (acquired)
Hemolytic ← ACTH + Splenectomy
Barrie and Blackburn C1477/55
(acquired)
Hemolytic ← *ACTH* and/or cortisone + Erythrocyte transfusion
Marchal et al. C356/54 (acquired)
Hemolytic → α β globulins ← ACTH ↑
Charbonnier and Dausset B99149/53
(*idiopathic*)
Hemolytic → γ globulins ← ACTH ↓
Charbonnier and *Dausset* B99149/53
(idiopathic)
Hemolytic → α β globulins ← Cortisone ↑
Charbonnier and *Dausset B99149/53*
(idiopathic)
Hemolytic → γ globulins ← Cortisone ↓
Charbonnier and Dausset B99149/53
(idiopathic)
Hemolytic → Leucocyte agglutinating substance in blood ← Cortisone + Agranulocytosis
Wasastjerna B99515/54
Pernicious Ø → 17 *hydroxycorticoids* in blood
Sandberg et al B99513/54
Pernicious → 17 hydroxycorticoids in blood ← Cortisone (free alcohol) cortisol (free acetate free alcohol)
Sandberg et al. B99513/54
Pernicious ↓ → 17 KS in urine
de Gennes C1118/54
Pernicious ↓ → Uropepsin
Gray et al. C1309/54
Pernicious ↓ → Adrenals (lipids)
Becker et al B97145/54
Pernicious → leucocytes in blood ← ACTH cortisol
Sandberg et al B99513/54
Red cell anemia (*pure*)—Pathogenesis
(thymus tumor)
Chalmers and Boheimer C698/54
Red cell *anemia* (*pure*) ← *ACTH*
Anonymous C6062/55 (*discussion*)
Refractory ← ACTH and/or cortisone
Ross et al B98568/54
Sickle cell ← ACTH and/or cortisone
(discussion)
Lievre and Renier B96791/53
Various ← ACTH (discussion)
Baar C6370/55

Paraoxypropiophenone ↑ in guinea pig
Cicala and Pugliese Carratelli B99796/53 (erythrocytes neutrophils eosinophils)
Paraoxypropiophenone ↓ in man
Cicala and Pugliese Carratelli B99796/53 (lymphocytes)
Paraoxypropiophenone ↑ in man
Cicala and Pugliese Carratelli B99796/53 (eosinophils)
PAS in man
Bottone and Cipolloni C1984/53 (eosinophils)
Phenylalanine ↓ in rat
Góth et al C3097/53 C3488/55 (eosinophils)
Protein ↑+Fasting in dog
Kramár et al B99000/54 (eosinophils)
Pyrogen in man
Bergmann et al C6217/54 (electric potential of erythrocytes leucocytes)
Salicylate ↓
Fantuzzi C3814/54 (eosinophils)
Salicylate in man
Done et al C5355/55 (eosinophils)
Roskam and van Cauwenberge C2616/54 (eosinophils)
Salicylate Ø in man
Coste et al B93715/53 (eosinophils)
Salicylate (intradermally) ↓ in man
Piccinelli and Nicrosini C2666/54 (eosinophils lymphocytes)
Salicylate ↓ in rat
Bounameaux and van Cauwenberge C1981/54 (thrombocytes)
Serotonin ↓ in mouse
Halberg B536/54 (eosinophils)
Thiosemicarbazone ↓ in man
Camerada and Leo B99812/53 (eosinophils)
Tissue extract, in rabbit
Moon and Tarshakovec C4282/54 (leucocytes)
Tryptamine *in mouse*
Halberg C536/54 (eosinophils)
Tryptophan ↓ in rat
Góth et al C3488/55 *(eosinophils)*
Valine ↓ in man
Goth et al C3097/53 (eosinophils)
Valine ↓ *in rat*
Góth et al C3097/53 C3488/55 (eosinophils)
Water (distilled i c) ↓ in man
Colucci et al B97827/53 (eosinophils)

Worm extract ↓↑ in sheep
Pautrizel et al B99766/51 (eosinophils)
Diet (protein) Ø in dog
Wilhelmj et al B96734/54 (eosinophils)
Diet+Diurnal variations in mouse
Visscher and Halberg C3418/55 (eosinophils)
Fasting ↓ in dog
Kramár et al B99000/54 (eosinophils)
Wilhelmj et al. B96734/54 C1667/54 (eosinophils)
Fasting ↓ in man
Gastaldi and *Fedeli B99742/54* (eosinophils)
Fasting ↓ in rat
Kramár et al B99000/54 (eosinophils)
Wilhelmj et al. C1667/54 (eosinophils)
Fasting+Diet (carbohydrates) Ø in dog
Wilhelmj et al *B96734/54* (eosinophils)
Fasting+Diet in dog
Wilhelmj et al C1667/54 *(eosinophils)*
Fasting+Diet (protein) ↑ in dog
Wilhelmj et al B96734/54 (eosinophils)
Fasting+Diet in rat
Wilhelmj et al C1667/54 (eosinophils)
Fasting+Refeeding ↑ in rat
Kramár et al B99000/54 (eosinophils)
Starvation in fowl and pheasant
Greeley C6617/55 (leucocytes)
Na *deficiency* ↓ *in man*
Thomas B97038/53 (eosinophils)
Pantothenic acid deficiency ↑ in man
Bean and Hodges B98137/54 *(eosinophils)*
Bean et al C6777/55 (eosinophils)
Protein deficiency in rat
Aschkenasy C1988/54 (lymphocytes)
Protein deficiency ↓ in rat
Aschkenasy C3100/54 *(erythrocytes)*
Diurnal variations in cattle
Moberg C6042/55 (leucocytes eosinophils)
Diurnal variations in man
Elmadjian C5436/55 (lymphocytes)
Engel et al C1912/55 (eosinophils)
Gemzell C4442/55 (eosinophils)

Other Blood Diseases

Agammaglobulinemia Ø → 17 hydroxy corticoids in blood ← ACTH
Good and Kelley C1903/55

Agammaglobulinemia → Blood count ← ACTH
Good and Kelley C1903/55 (eosinophils lymphocytes)

Agranulocytosis ← ACTH and/or cortisone
Dreyer B96852/54 (mesantoin)
Goldman C3613/55 (chlorpromazine)
Hutchison and Conway C6050/55
Kothe and Wenderoth B99249/53
Landau and Gajewska B99250/53 (hyperthyroidism)
Moeschlin et al C6154/54
Pinkerton C6406/55
Prowse B99049/54 (gold)
Stotz and Hesz B978_8/53 (atophan)
Tischendorf and Muller B99211/54
Wraith and Hart C6385/55 (discussion)

Agranulocytosis → Body temperature ← Cortisone ↓
Kirkeby B98_05/54 (drugs)

Agranulocytosis → Blood count (granulocytes) ← Cortisone ↑
Kirkeby B98_05/54 (drugs)

Eosinophilia–Pathogenesis (adrenals)
Deschiens and Mauze B96914/53 (tropical)

Eosinophilia ← Cortisone
Deschiens B98945/53 (parasites)
Deschiens et al B98946/53 (parasites)

Eosinophilia → Na/potassium ratio in urine ← ACTH (gelatin)
Nabarro B999 0/54 (allergic)

Eosinophilia Ø → 17 hydroxy corticoids in blood ← ACTH
Eik Nes et al C927/55

Eosinophilia → 17 KS in urine ← ACTH (gelatin)
Nabarro B99930/54 (allergic)

Eosinophilia → Eosinophils in blood ← ACTH Ø
Deschiens et al C124/53 (parasitic)

Eosinophilia → Eosinophils in blood ← ACTH ↓
Deschiens et al C124/53 (tropical)

Eosinophilia → Eosinophils in blood ← ACTH (gelatin)
Nabarro B99930/54 (allergic)

Eosinophilia → Eosinophils in blood ← Cortisone Ø
Deschiens et al. C124/53 (parasitic)

Eosinophilia → Eosinophils in blood ← Cortisone ↓
Deschiens and Mauze B96914/53
Deschiens et al C124/53 (tropical)

Eosinophilogenic intoxication → Eosinophils in blood ← ACTH ↓ cortisone ↓
Deschiens et al. C124/53

Erythroblastosis foetalis ← ACTH and/or cortisone
Allen and Diamond B985_6/54 (discussion)
Ros B97337/54 (discussion)

Erythroblastosis foetalis ← Cortisone (to mother) + Pregnancy
Hunter B97876/54
Teton and Treadwell B99909/54

Erythrocytosis–Pathogenesis (hypophysis)
Green et al. C1816/55

Erythrocytosis → 17 KS in urine ← Acyclic menstrual bleeding
Green et al. C1816/55

Erythromyelosis ← ACTH
Abel et al C_902/54

Felty s syndrome → Blood count ← ACTH Ø
Hutchison and Alexander B98_70/54 (leucocytes)

Letterer Siwe s disease ← ACTH
Orrild and Lunding B96915/53

Leucosis–Pathogenesis (thymus)
Santy et al C2_15/54

Leucosis ← Cortisone + Antibiotic (actinomycine C)
Janbon C2912/54

Mononucleosis ← ACTH
Mandel et al C6788/55 (infectious)

Mononucleosis ← Cortisone + Antibiotic
Quinn et al C3524/_5

Mononucleosis (infectious) → Nerves ← ACTH and/or cortisone
Lopez et al. C4432/54

Neutropenia (cyclic) ← ACTH and/or cortisone
Natelson B99251/53

Polycythemia vera–Pathogenesis (hypothalamus–hypophysis)
Haynal B98416/53

Polycythemia vera ← Paraoxypropiophenone
Haynal B98416/53

Polycythemia vera → Corticoids in urine (reducing steroids)
van Cauwenberge C1976/54

Polycythemia vera → 17 KS in urine
van Cauwenberge C1976/54

Thalassaemia → Erythrocyte resistance (osmotic) ← ACTH
Ringelhann and Toth C_142/54

Leukemias

Review
Kaplan B97941/54

Pathogenesis
Black Schaffer et al B97639/52 (atomic bomb rays)
Dobriner et al B99411/54 (adrenals)
Ellinger B97090/54 (hypophysis adrenals)
Gelin and Siboun C6706/54 (pregnancy)
Hirabayashi and Daida B97646/53 (atomic bomb rays)
Matsuura B97644/52 (atomic bomb rays)
Nishimaru et al B97642/52 (atomic bomb rays)
Raushenbakh et al. B97214/52 (nerves)
Wada B97645/52 (atomic bomb rays)
Yamamoto B97641/53 (atomic bomb rays)
Yamamoto and Matsuura B97643/52 (atomic bomb rays)

Leukemias ← Stimuli

ACTH and/or cortisone
Anonymous B97139/54 (discussion)
de Asua C2879/54
Bakim and Erpek B99255/53
Begemann C5986/55 (discussion)
Beler and Under B99254/53
Bernard and Deltour B96490/53 (various)
Bottone and Bisciomi C582/53
Burchenal B98500/54 (discussion)
Burchenal et al B98163/54 (acute chronic lymphocytic—review)
Carere Comes B97405/53
Colsky et al C4543/55
Decortis et al C2613/54
Diamond B96491/53 (acute chronic)
Ehel and Heaney C4053/55
Fessas et al C634/54
Frelick and *Sluzar B96488/53* (lymphatic)
Heaney and Ehel C4382/55
Marlow and Bartlett B96487/53 *(lymphatic)*
Marmont and Fusco B96489/53 (acute) B98823/53 (discussion)
Oehme B98732/53 C5037/55
Pearson et al. C6224/55 (discussion)
Quattrocchi and Russo C465/54
Raynolds et al C1158/55 (aleukemic stem cell leukemia)
Rosenthal B97538/54 (discussion)
Schulten C1041/54
Slot C3901/54
Tischendorf and Muller B99211/54
Tobias C635/54
Villasenor et al B96492/53 *(acute)*
Wilkinson et al B96493/53 (acute—discussion)
Williams C4544/55
Wright C2451/55 (discussion)

Cortisone+Amethopterin
Burchenal B98837/54

Cortisone+Protein deficiency
Ehck and Heaney C4370/55

Cortisol
de Asua C2879/54
Pearson et al C6224/55

Folliculoids
Blackburn C3900/54
Gelin and Siboun C6706/54

Pregnancy
Bernoth B99253/53

Testoids
Gelin and Siboun C6706/54

Leukemias → Targets

Oxygen consumption in lymphocytes (in vitro) ← Cortisone (to lymphocytes in vitro)
Brighta and Parzer C6707/54

Nitrogen in urine ← Cortisone+Testoids
Ehel and Heaney C4053/55

Nitrogen potassium phosphorus in urine ← *Cortisone ↑+Protein deficiency*
Ehel and Heaney C4370/55

ACTH in hypophysis
Burt and Velardo B94001/53 *(lymphatic)*

Corticoids in urine ← ACTH
Bernard et al C207/53 (reducing)
Dobriner et al B99411/54 (fractions of ketonic and nonketonic steroids)

Corticoids in urine ← Cortisone
Deltour et al B99519/54 (F Cs)

17 KS in urine ← Sex
Bernard et al C207/53

Ketosteroids (various) in urine ← Cortisone
Deltour et al B99519/54

Phenolsteroids in urine ← Cortisone
Deltour et al B99519/54

Pregnanediol in urine ← Cortisone
Deltour et al B99519/54

Hypothalamus
Brieali B96715/53 (histology)

Adrenals
Pentimalli B99091/53 (histology)

Adrenals ← ACTH
Landing C3636/55 (histology of zones)

Spleen ← ACTH cortisone
Reinhard and Loeb C6431/55

Cortisone in rabbit
Bounameaux C1979/54 (blood coagulation adhesion of thrombocytes)
Bounameaux C1983/53 (bleeding time)
Rosen et al B99897/54
Cortisone ↓ in rat
Bounameaux and van Cauwenberge C1981/54 (adhesion of thrombocytes in vitro)
Cortisone ↑ in rat
Bounameaux and van Cauwenberge C1981/54 (blood coagulation)
Cortisone+Anticoagulant
Deutsch et al C321/54 (discussion)
Cortisone+Heparin in rabbit
Rosen et al B99897/54
Cortisone ↓+Histamine in rabbit
Bounameaux C1980/55 (adhesion of thrombocytes in vitro)
Cortisone ↑+Histamine in rabbit
Bounameaux C1980/55 (blood coagulation time)
Insulin ↑ in rat
Jaques B98877/54 (prothrombin time)
Age (senile) in man
Zabban 4891/54 (blood coagulation bleeding time)

Blood Clotting ← Stressors

Shock ↓ (experimental embolism) in dog
Schneider C6037/55
Trauma in guinea pig
Calogerà B97763/53 (blood coagulation prothrombin time)
Trauma in man
Rizzati B97762/53
Cold ↑ in dog
Sircar B99674/54 (bleeding and clotting time)
Electrotrauma in guinea pig
Calogerà C3300/54 (recalcification)
Nerves (pain) in dog
Hetenyi and Varga C1526/54 (blood coagulation inactivation of thrombin) C4881/54 (thrombin inactivation)
Hypoxia+Decompression in man
Koller et al B96680/54 (antithrombin)
Antibiotic ↑ in man
Tsevrenis and Karali C506/53 (coagulation time)
Dextran in man
Ricketts et al B99178/53

Drug (anticoagulant antiphlogistic uricosuric—discussion)
Sougin Mibashan and Horwitz C6254/55
Formalin ↑ in rat
Jaques B98877/54 (prothrombin time)
Histamine ↓ in rabbit
Bounameaux C1980/55 (blood coagulation time)
Histamine ↑ in rabbit
Bounameaux C1980/55 (adhesion of thrombocytes in vitro)
NaCl (i p) ↑ in rat
Jaques B98877/54 (prothrombin time)
Peptone in dog
Baeckeland and Lecomte C519/53 (coagulation time)
Salicylate ↓ in man
Bounameaux et al B99887/54 (adhesion of thrombocytes in vitro)
Salicylate ↑↓ in man
Niederland et al. C5823/54 (prothrombin time)
Salicylate in rat
Bounameaux and van Cauwenberge C1981/54 (blood coagulation adhesion of thrombocytes in vitro)
Serotonin in rabbit
Lecomte et al C1919/54

Thromboembolic and Hemorrhagic Diseases

Purpuras

Antithromboplastic anticoagulant in blood ← ACTH and/or cortisone Ø
Torregrosa et al B99884/54
Hemophilia (familiar) ← ACTH and/or cortisone
Conti and Caltabiano C6669/55
Hemorrhagic diathesis ← ACTH and/or cortisone
Beaumont C1236/54 (with anticoagulant inhibiting thromboplastin formation)
Hemorrhagic fever ← Noradrenaline
Froeb and McDowell C2916/54
Yoe C2917/54
Hemorrhagic fever (epidemic) → Hypophysis (discussion)
Knudsen C2044/54
Hemorrhagic fever (epidemic) → Adrenal (discussion)
Knudsen C2044/54
Thrombocytopenia ← ACTH
Jochweds C5736/54
Loopuyt C2957/54 (idiopathic)
Tischendorf and Muller B99211/54

Various blood diseases ← Cortisone + Antibiotic (actinomycin C)
Olmer C2513/54

ERYTHROCYTE SEDIMENTATION

RATE (ESR)

(For earlier pertinent data cf also *Stress* p 442 AROS 1951 p 294 AROS 1952 p *198 AROS 1953 p 255 AROS 1954 p* 437)

ESR ← Various

Psychic diseases + ABA (chlorpromazine) ↑ in man
Bram B98225/54
Venous obstruction (peripheral) ↓ in man
Loosen et al B99148/53
Trauma ↑ in man
Franksson and Gemzell C2010/53 C2130/53
Hemorrhage ↓ in dog
Waud B98897/54
Muscular exercise ↓ in man
Loosen et al B99148/53
Starvation ↑ in man
Johnson C4161/54

BLOOD CLOTTING

(Including blood sludging)

(For earlier pertinent data cf also *Stress* p 444 AROS 1951 p 295 AROS 1952 p 198 AROS 1953 pp 255 256 AROS 1954 pp 438 439)

Blood Clotting ← Stimuli

Sympathectomy Ø in rabbit and rat
Copley and Stefko C533/54
(bleeding time)
Sympathectomy + Adrenalectomy in rat
Copley and Stefko C533/54
(clot resistance)
Sympathectomy + Adrenalectomy + Ionizing rays in rat
Copley and Stefko C533/54
(bleeding time)
ACTH Ø
Cheymol and Leroux C1272/53
(in vitro)
ACTH in dog
Cheymol and Leroux C1272/53
ACTH in man
Bounameaux et al B99887/54
(bleeding time *adherence of* platelets in vitro)
Chatterjea and Salomon B98844/54
(prothrombin activity
thromboembolic complications)
Cheymol and Leroux C1272/53
(thromboembolism hemorrhages)
Fisher and Lund B97600/54
(blood coagulation time
prothrombin proconvertin
concentration)
Sussman et al C638/54
(coagulation time plasma prothrombin time serum prothrombin consumption time)
ACTH *Ø in rat*
Bounameaux and van Cauwenberge C1981/54 (blood coagulation)
ACTH ↓ in rat
Bounameaux and van Cauwenberge *C1981/54 (adhesion of* thrombocytes in vitro)
Adrenalectomy Ø in rabbit and in rat
Copley and Stefko C533/54
(bleeding time)
Adrenalectomy + *Corticoids Ø* in rat
Jaques B98877/54
(prothrombin time)
Adrenalectomy + Dye in rabbit
Balduzzi B96441/52
(phagocytic and fibroblastic activity in thrombus)
Adrenalectomy + NaCl (i p) Ø in rat
Jaques B98877/54
(prothrombin time)
Adrenaline
Forattini et al B98326/53
Adrenaline ↓ in rabbit
Sen et al B99177/53
(blood clotting time)
Adrenaline Ø + Splenectomy in rabbit
Sen et al B99177/53
(blood clotting time)
Cortisone Ø
Cheymol and Leroux C1272/53
(in vitro)
Cortisone in dog
Cheymol and Leroux C1272/53
Cortisone in man
Bounameaux *et al B99887/54*
(bleeding time adherence of platelets in vitro)
Chatterjea and Salomon B98844/54
(prothrombin activity
thromboembolic complications)
Cheymol and Leroux C1272/53
(thromboembolism hemorrhages)
Fisher and Lund B97600/54
(blood coagulation time
prothrombin proconvertin
concentration)
Sussman et al C638/54
(coagulation time plasma prothrombin time serum prothrombin consumption time)
Tsevrenis and Karali C506/53
(coagulation time)

ACTH (to mother) ↓+Pregnancy+Age (foetal) in monkey
Schmidt and Hoffman B96065/54 (size)
ACTH+Testoids MAD in rat
Selye C2007/55 (weight)
ACTH+Thiourea+Cold in rat
Freedman and Gordon C1799/55 (weight)
ACTH+Ascorbic acid in hamster
Schreiber C3494/54
ACTH+Casein+KCl+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
ACTH+KCl+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
STH in mouse
Dougherty C4968/55 (weight)
Nagareda and Kaplan C4401/55 (weight)
STH in rat
Matteini and Marabini B99837/53 (weight)
Selye and Bois C5466/55 (weight)
STH ↑ in rat
Conti B9867/54 (weight)
Matteini and Giusti B98288/53 (weight)
STH ↑+Adrenalectomy in mouse
Dougherty C4968/55 (weight/body weight)
STH Ø+Adrenalectomy+Cortisol in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+Cortisol+DOCA in rat
Selye and Bois C1718/55 C5466/55 (weight)
STH+Adrenalectomy+Cortisol+DOCA +Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH+Adrenalectomy+Cortisol+ Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH ↑+Adrenalectomy+DOCA in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+DOCA+ Ovariectomy in rat
Bois and Selye C4580/55 (weight)
Selye and Bois C1718/55 (weight)
STH ↑+Adrenalectomy+DOC+Testis extirpation+NaCl in mouse
Nagareda and Kaplan C4401/55 (weight)
STH+Adrenalectomy+Aldosterone ↑+ Ovariectomy in rat
Selye and Bois C1718/55 (weight)
STH+Adrenalectomy+NaCl in rat
Bois and Selye C4580/55 (weight)
Selye B100000/54 (weight)
STH ↑+Testis extirpation in rat
Sforzini C86/53 C2318/53 (weight)
STH+Testis extirpation+Testoids ↓ in rat
Sforzini C86/53 C3218/53 (weight)
STH+MAD+Nephrectomy (partial)+ NaCl in rat
Salgado C1002/54 (weight)
STH Ø+Ionizing rays in rat
Sellers and Barlow B98893/54 (weight/body weight)
STH+Drugs (antimitotic) in rat
Sforzini C3214/54 (weight)
STH+Casein+Protein deficiency in rat
Aschgenasy and Dray C1990/54 C1991/53 (weight)
STH+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
FSH+Folliculoids+Sex (♂) in rat
Perry C6286/55 (weight)
TTH+Adrenalectomy in rat
Shibata B98625/54 (weight)
TTH+Adrenalectomy+DOC+Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (weight)
Adrenalectomy in rat
Shibata B98625/54 (histology lymphocytes acidophils)
Adrenalectomy ↑ in rat
Hoelscher B99401/54 (weight)
Ogawa B98659/53 (phosphorus radioactive)
Shibata B98625/54 (weight)
Shrewsbury and Reinhardt C5956/55 (weight)
Adrenalectomy+Adrenaline Ø in rat
Hissink C1502/54 (histology)
Adrenalectomy+Adrenaline+Cortisol in rat
Stephenson C5290/55 (weight)
Adrenalectomy+Cortisone in rat
Fraile C4666/53 (weight)
Hissink C1502/54 (histology)
Ogawa B98659/53 (phosphorus radioactive)
Shibata B98625/54 (histology lymphocytes acidophils)
Adrenalectomy+Cortisone+Testis extirpation in rat
Tremolieres et al C19_4/54 (weight)
Adrenalectomy+Cortisol in rat
Bois and Selye C4580/55 (weight)

Onyalai ← Cortisone
Lewis and Lurie B97760/53
Onyalai ← Adrenaline + ABA (antihistamine)
Laufer C6257/53
Purpura annularis telangiectodes ← ACTH and/or cortisone
Kass et al B99886/54
Schonlein Henoch s disease ← ACTH and/or cortisone
Piramo B99319/53
(discussion)
Spiess C1036/54
Thrombocytopenic purpura ← ACTH and/or cortisone
Benhamou et al C2958/54
Elliott and Hyman B99883/54
Erdstein and Iriarte B99518/54
Garan and Gurevin B96788/52
Nelson B97761/53
Newmark C6023/55
Thrombocytopenic purpura ← ACTH and/or cortisone + Splenectomy
Belber et al B99517/54
(cat scratch disease)
Brush et al B98502/54
Thrombocytopenic purpura → Wound healing ← ACTH and/or cortisone
Brush et al B98502/54
Thrombocytopenic idiopathic purpura ← *ACTH and/or cortisone*
Kauer B97339/54 (discussion)
Pariser and Wasserman C5737/54
Robson B98503/54
Zarafonetis et al B97843/54
Thrombocytopenic idiopathic purpura ← Cortisol
Zarafonetis et al B97843/54
Thrombocytopenic idiopathic purpura → Wound healing ← ACTH and/or *cortisone*
Zarafonetis et al B97843/54
Thrombocytopenic idiopathic purpura → Wound healing ← Cortisol
Zarafonetis et al B97843/54
Thrombotic *thrombocytopenic* purpura ← ACTH and/or cortisone
Miller and Schaaf B97844/54

HEMOPOIETIC SYSTEM

(Including the lymphopoietic system)
(For earlier pertinent data cf also *Stress* pp 450-486 AROS 1951 pp 299 310 AROS 1952 pp 201 208 AROS 1953 pp 2o7 264 AROS 1954 pp 440 449)

Thymus

Generalities
Anonymous C5612/55 (flavonoids in *thymus* of cattle—discussion)
Keynes B98218/54 (review)
Tesseraux C909/53 (review)

Thymus ← Stimuli

Hypophysectomy + ACTH (intradermally intramuscularly) in rat
Bottone B98789/54
(weight histology)
Hypophysectomy + ACTH + STH + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight)
Hypophysectomy + STH in rat
Cavallero and Pellegrini C1449/53
(histology)
Hypophysectomy + STH ↑ in rat
Hartmann B98561/54 (weight)
Hypophysectomy + STH + Folic acid in rat
Penhos and Foglia C6746/54
(weight)
Hypophysectomy + STH + Vitamin B_1 in rat
Penhos and Foglia C6746/54
(weight)
Hypophysectomy + Cortisone ↓ in rat
Greenberg and Aterman B99025/54
(weight)
Hypophysectomy + Folliculoids + Testis extirpation + Pancreatectomy (partial) + Diet (force fed) in rat
Foglia et al C4922/54 (weight)
Hypophysectomy + Pregnancy Ø in rat
Elert B96960/54 (weight)
Hypophysectomy + Testis extirpation + Testoids + Pancreatectomy (partial) + Diet (force-fed) in rat
Foglia et al C4922/54 (weight)
Hypophysectomy + Thyroxin ↑ in rat
Scow B97432/54 (weight)
Hypophysectomy + Drugs (SC 4473 SC 3402) in rat
Sturtevant C2757/55 (weight)
ACTH in hamster
Schreiber C3494/54
ACTH ↓ in mouse
Flux B98952/54 (weight)
ACTH ↓ in rat
Robbins et al C1802/55 (nucleic acid phosphorus mitosis)
ACTH ↑ in rat
Tadokoro and Nomura B98628/53
(eosinophils)
ACTH + STH in rat
Selye C2007/55 (weight)
ACTH + STH + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight)
ACTH + DOCA in rat
Selye C2007/55 (weight)
ACTH ↓ + Pregnancy in monkey
Schmidt and Hoffman B98565/54
(size)

ACTH (to mother) ↓+Pregnancy+Age (foetal) in monkey
Schmidt and Hoffman B96565/54 (size)
ACTH+Testoids MAD in rat
Selye C2007/55 (weight)
ACTH+Thiourea+Cold in rat
Freedman and Gordon C1799/55 (weight)
ACTH+Ascorbic acid in hamster
Schreiber C3491/54
ACTH+*Casein*+KCl+*Protein* deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
ACTH+KCl+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
STH in mouse
Dougherty C4968/55 (weight)
Nagareda and Kaplan C4401/55 (weight)
STH in rat
Mattoni and Marabini B99837/53 (*weight*)
Selye and Bois C5466/53 (weight)
STH ↑ in rat
Conti B9867/54 (weight)
Mattern and Giusti B98258/53 (weight)
STH ↑+Adrenalectomy in mouse
Dougherty C4968/55 (weight/body weight)
STH Ø+Adrenalectomy+Cortisol in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+Cortisol+DOCA in rat
Selye and Bois C1718/55 C5466/55 (weight)
STH+Adrenalectomy+Cortisol+DOCA +Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH+Adrenalectomy+Cortisol+ Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH ↑+Adrenalectomy+DOCA in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+DOCA+ Ovariectomy in rat
Bois and Selye C4580/55 (weight)
Selye and Bois C1718/55 (weight)
STH ↑+Adrenalectomy+DOC+Testis extirpation+NaCl in mouse
Nagareda and Kaplan C4401/55 (weight)
STH+Adrenalectomy+Aldosterone ↑+ Ovariectomy in rat
Selye and Bois C1718/55 (*weight*)

STH+Adrenalectomy+NaCl in rat
Bois and Selye C4580/55 (weight)
Selye B100000/54 (weight)
STH ↑+Testis extirpation in rat
Sforzini C86/53 C2318/53 (*weight*)
STH+Testis extirpation+Testoids ↓ in rat
Sforzini C86/53 C3218/53 (weight)
STH+MAD+Nephrectomy (partial)+ NaCl, in rat
Salgado C1002/54 (weight)
STH Ø+Ionizing rays in rat
Sellers and Barlow B98893/54 (weight/body weight)
STH+Drugs (antimitotic) in rat
Sforzini C3214/54 (weight)
STH+*Casein*+*Protein* deficiency in rat
Aschgenasy and Dray C1990/54 C1991/53 (weight)
STH+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
FSH+Folliculoids+Sex (♂) in rat
Perry C6286/55 (weight)
TTH+Adrenalectomy in rat
Shibata B98625/54 (weight)
TTH+Adrenalectomy+DOC+Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (*weight*)
Adrenalectomy in rat
Shibata B98625/54 (histology lymphocytes acidophils)
Adrenalectomy ↑ in rat
Hoelscher B99401/54 (weight)
Ogawa B98639/53 (phosphorus radioactive)
Shibata B98625/54 (weight)
Shrewsbury and Reinhardt C5956/55 (weight)
Adrenalectomy+Adrenaline Ø in rat
Hissink C1502/54 (*histology*)
Adrenalectomy+Adrenaline+Cortisol in rat
Stephenson C5290/55 (weight)
Adrenalectomy+Cortisone in rat
Fraile C4668/53 (weight)
Hissink C1502/54 (histology)
Ogawa B98639/53 (*phosphorus radioactive*)
Shibata B98625/54 (histology lymphocytes acidophils)
Adrenalectomy+Cortisone+Testis extirpation, in rat
Tremolieres et al C1924/54 (weight)
Adrenalectomy+Cortisol, in rat
Bois and Selye C4580/55 (weight)

Adrenalectomy+Cortisol+DOCA
in rat
Selye and Bois C5466/55 (weight)
Adrenalectomy+Cortisol+DOCA,
ovariectomy+Folliculoids
in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Cortisol+DOCA+
Folliculoids+Sex in rat
Selye C839/55 (weight)
Adrenalectomy+Cortisol+DOCA+MAD
in rat
Selye C2007/55 (weight)
Adrenalectomy+Cortisol+DOCA+Diet
in rat
Ventura C5857/55 (weight)
Adrenalectomy+Cortisol+DOCA+
Starvation, in rat
Ventura and *Selye C1531/55*
(weight)
Adrenalectomy+Cortisol+Aldosterone ↑
in rat
Selye B98268/55 C1451 (weight)
Adrenalectomy+Cortisol+Ovariectomy+
Luteoids in rat
Selye C839/55 (weight)
Selye et al C5677/55 (weight)
Adrenalectomy+Cortisol+Folliculoids ↓
in rat
Selye C1824/55 (weight)
Selye et al C5677/55 (weight)
Adrenalectomy+Cortisol+MAD in rat
Selye C2007/55 (weight)
Adrenalectomy+Cortisol+NaCl, in rat
Selye C2008/55 (weight)
Adrenalectomy+Cortisol+Diet in rat
Ventura C5857/55 (weight)
Adrenalectomy+DOCA in rat
Bois and Selye C4580/55 (weight)
Selye and Bois C5466/55 (weight)
Adrenalectomy+DOCA+Ovariectomy+
Folliculoids in rat
Selye C839/55 (weight)
Selye et al C5677/55 (weight)
Adrenalectomy+DOCA+Folliculoids ↓
in rat
Selye C1824/55 (weight)
Selye et al C5677/55 (weight)
Adrenalectomy+DOCA+Diet in rat
Ventura C5857 55 (weight)
Adrenalectomy+Cpd B ↓ in rat
Fruhman and Gordon C1902/55
(weight)
Adrenalectomy+Ovariectomy+Folliculoids+Luteoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Ovariectomy+Luteoids
in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Folliculoids in rat
Selye et al C5677/55 (weight)

Adrenalectomy+Folliculoids ↓+NaCl
in rat
Selye C1824/55 (weight)
Adrenalectomy+Pregnancy Ø in rat
Elert B96960/54 (weight)
Adrenalectomy+Testis extirpation+
Thyroxin in rat
Shrewsbury and Reinhardt
C5956/55 (weight)
Adrenalectomy+MAD+Nephrectomy
(partial)+NaCl, in rat
Salgado C1002/54 (weight)
Adrenalectomy+Thyroidectomy in rat
Shrewsbury and Reinhardt C5956/55
(weight)
Adrenalectomy+Thyroxin in rat
Shrewsbury and Reinhardt C5956/55
(weight)
Adrenalectomy+Aminopterin ↓ in rat
Lewis et al B92668/53
Adrenalectomy+Casein in rat
Hissink C1502/54 (histology)
Adrenalectomy+Starvation in rat
Ventura and Selye C1531/55
(weight)
Adrenalectomy+Parabiosis in rat
Hoelscher B99401/55 C2463/55
(weight)
Hoelscher and van Fossan C1592/54
(weight)
Adrenaline ↓ in rat
Fekete and Prokai C3200/54
(weight)
Adrenaline+*Cortisol* in rat
Stephenson C5290/55 (weight)
Adrenaline+Thiourea+Cold in rat
Freedman and Gordon C1799/55
(weight)
Adrenaline+Vitamin B_1 ↑ in rat
Fekete and Prokai C3200/54
(weight)
ACE+*Thiourea+Cold* in rat
Freedman and Gordon C1799/55
(weight)
Cortisone ↓ in guinea pig
Bodlund and Gyllensten C1315/54
(weight)
Cortisone in guinea pig and rabbit
Businco B99102/54 (histology)
Cortisone ↓ in mouse
Flux B98932/54 (weight)
Cortisone ↓ in rat
Blivaiss et al *C1602/54* (weight)
Bodansky and Money B96571/54
(weight)
Cortisone ↑ in rat
Tadokoro and Nomura B98628/53
(eosinophils)
Cortisone (acetate free alcohol) in rat
Stephenson C5290/55 (weight)
Cortisone+Thyroid extract, in rat
Greenberg and Aterman C5381/55
(weight)

Cortisone ↓ + Age (immature) in rat
Bhvaiss et al. B98138/54 (weight)
Cortisone + Protein ↑ in rat
Tremolières et al C1924/54 (weight)
Cortisone + Vitamin B_1 ↑ in rat
Venkataraman et al B99140/54 (weight)
Cortisone + Diet starvation in hamster
Knigge C3678/55 (weight)
Cortisone + Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Cortisone (21 n oenanthate caprylate undecylate) in rat
Junkmann C6036/54 (weight)
Cortisol in guinea pig
Hausberger and Ramsay C4481/55 (weight adipose tissue)
Cortisol ↓ in mouse
Flux B98952/54 (weight)
Cortisol in rat
Boss and Selye C4550/55 (weight)
Cortisol (acetate free alcohol) in rat
Stephenson C5290/55 (weight)
Cortisol + DOCA in rat
Boss and Selye C4550/55 (weight)
Cortisol + Ascorbic acid Ø in rat
Stephenson C5290/55 (weight)
21 desoxycortisol in rat
Byrnes and Shipley C6329/55 (weight)
9α-chlorocortisol + Nephrectomy (partial) + NaCl in rat
Selye B98967/53 (weight)
9α-fluorocortisol ↓ in rat
Stephenson C5290/55 (weight)
9α-fluorocortisol + Nephrectomy (partial) + NaCl in rat
Selye B98967/55 (weight)
Δ cortisone Δ cortisol in rat
Perlman and Tolksdorf C5281/55 (weight)
DOC (free alcohol) in rat
Fruhman and Gordon C3622/54 (weight)
DOCA Ø in hamster
Knigge C263/54 (weight)
DOCA Ø in mouse
Timiras et al B99494/54 (weight)
DOCA in rat
Byrnes and Shipley C6329/55 (weight)
DOCA Ø in rat
Gardner et al B96707/54 (weight)
DOCA ↑ + Folliculoids in rat
Conti B98675/54 (weight)
DOCA + Folliculoids + Testis extirpation + Testoids + Thyroid extract + Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA + Folliculoids + Testoids + Thyroid extract + Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA + Nephrectomy (partial) + NaCl (pair fed) + Trimethylglucose ↓ in rat
Skelton B97427/54 (weight)
DOCA + Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA + Diet starvation in hamster
Knigge C3678/55 (weight)
Desoxocortisone ↓ in mouse
Flux B98952/54 (weight)
Cpd A ↓ in mouse
Flux B98952/54 (weight)
Cpd A ↓ in rat
Byrnes and Shipley C6329/55 (weight)
Cpd B ↓ in mouse
Flux B98952/54 (weight)
Cpd B ↓ in rat
Byrnes and Shipley C6329/55 (weight)
Gonadectomy + Folliculoids testoids + Thyroidectomy + Thyroxin in guinea pig
Comsa B98300/53 (histology)
Ovariectomy ↑ in rat
Plagge B99838/53 (weight/body weight)
Ovarian transplant (immature in testis) ↓ in rat
Fazzari B98083/53 (weight)
Folliculoids ↓ in rat
Conti B98675/54 (weight)
Ichikawa B97700/53 (weight)
Folliculoids ↓ + Thyroidectomy in guinea pig
Comsa B98300/53 (weight)
Folliculoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Folliculoids + Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
Luteoids hydroxyprogesterone 11 ketoprogesterone in rat
Byrnes and Shipley C6329/55 (weight)
Pregnancy ↓ in rat
Elert B96960/54 (weight)
Testis extirpation ↑ in rat
Plagge B99838/53 (weight/body weight)
Testis extirpation + Testoids in rat
Sforzini C3214/54 (weight)
Testis extirpation + Testoids + Thyroidectomy *in guinea pig*
Comsa B98300/53 (histology)

Testis extirpation + Thyroxin in rat
Shrewsbury and Reinhardt C5956/55 (*weight*)
Testis extirpation + Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Testoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C19901/54 C1991/53 (weight)
Testoids + Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Aschkenasy and Dray B99606/54 (weight)
MAD + Thyroidectomy + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight)
Thyroidectomy ↓ in rabbit
Blum B99639/54 (weight/body weight)
Thyroidectomy + Renal lesion (experimental) + Prostatectomy in rat
Lehr and Martin C5267/55 (weight)
Thyroidectomy + Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Thiourea ↓ in rat
Freedman and Gordon C1799/55 (weight/body weight)
Thiourea + Cold ↓ in rat
Freedman and Gordon C1799/55 (weight)
Thyroxin in rat
Shrewsbury and Reinhardt C5958/55 (weight)
Thyroxin + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Thyroxin + Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Aschkenasy and Dray B99606/54 (weight/body weight weight)
Glucagon in rat
Cavallero et al C2038/53 (histology)
Thymectomy + Ionizing rays in mouse
Kaplan et al C4585/55 (tumorigenesis in nonirradiated implant)
Thymus extract ↑ in rat
Matteini and Marabini B99837/53 (weight)
Lymph node extract in rat
Matteini and Marabini B99837/53 (weight)
Liver extract in rat
Matteini and Marabini B99837/53 (weight)
Age (*foetal newborn*) *in man*
Hughes B99710/54 (weight)
Age in rabbit
Blum B99639/54 (weight)
Age (newborn) + Diet (goitrogenous to mother) Ø in rabbit
Blum B99639/54 (weight/body weight)
Heredity + Cold Ø in rat
Heroux and Hart B98996/54 (*weight/body weight*)

Thymus ← Stressors

Tumor (Walker tumor) in rat
Boyd et al C1198/55 (weight water lipids)
Tumor (induced) in rat
Hoepke B97078/53 (*size of cortex thymocytes*)
C2015/54 (weight)
Bile duct ligature ↓ in rat
Telkka and Kuusisto B97576/54 (weight)
Tumor (mammary carcinoma–transplant) ↓
Acetic acid hydrazide ↓ in mouse
Freedlander et al B98145/54 (weight)
Ionizing rays ↓ in mouse
Rugh B98033/54 (*dry weight*)
Electroshock Ø in mouse
Timiras et al B99494/54 (weight)
Muscular exercise in rat
Balboni B91331/53 (histology nucleic acid)
Muscular exercise ↓ in rat
Balboni B91331/53 (weight)
Drugs (*SC 4473 SC 3402*) in rat
Sturtevant C2757/55 (weight)
CCl_4 in rabbit
Ichida B97674/52 (*histological changes*)
Formalin in rat
Hissink C1502/54 (histology)
Formalin ↓ in rat
Ichikawa B97699/53 (weight)
Heparin ↓ in rabbit
de Matteis *C2016/54* (weight)
Histidine deficiency ↓ in rat
Scott C2639/54 (weight)
Hydantoin derivative ↓ in rat
Woodbury et al *C2500 55* (weight)
Na Iodine + Diet (goitrogenous) in rabbit
Blum B99639/54 (weight/body weight)
Ethylsulfathiazole ↓ in rat
Cressen C2155/54 (weight)
Kyromen in rat
Weller C8135/54 (weight)
Rauwolfia ↓ in rat
C unt et al B97572/54 (weight)
Strophantus derivatives Ø in rat
Gardner et al B98707/54 (weight)

Diet in rabbit
Blum B99639/54 (weight/body weight)
Fasting in rabbit
Blum B99639/54 (weight/body weight)
Starvation in hamster
Knigge C5678/55 (weight)
Starvation in rat
Ventura and Selye C1531/55 (weight)
Histidine deficiency ↓ in rat
Scott B97459/54 (size)
Protein deficiency in rat
Aschkenasy C1988/54 (weight)

Lymphatic Tissues

Lymphatic Tissues ← Various

Denervation (posterior roots) ↓ in rabbit
Tada B97605/52 (lymph nodes—size)
Denervation (posterior roots) ↑ in rabbit
Tada B97605/52 (lymphocytes in lymph lymph flow)
Sympathectomy ↓ in rabbit
Tada B97605/52 (lymphocytes in lymph lymph flow)
Sympathectomy ↑ in rabbit
Tada B97605/52 (lymph nodes—size)
Hypophysectomy + STH in rat
Cavallero and Pellegrini C1449/53 (lymph nodes—histology)
ACTH in guinea pig
Kohn C756/54 (lymph nodes—histology)
ACTH (long term) in rat
Liebegott et al C5469/53
ACTH + STH in rat
Selye C2007/55 (lymph nodes—weight)
ACTH + DOCA in rat
Selye C2007/55 (lymph nodes—weight)
ACTH ↓ + Pregnancy in monkey
Schmidt and Hoffmann B96565/54 (size of lymph nodes)
ACTH (to mother) Ø + Pregnancy + Age (foetal) in monkey
Schmidt and Hoffmann B96565/54 (size of lymph nodes)
ACTH + Testoids MAD in rat
Selye C2007/55 (lymph nodes—weight)
ACTH Ø + Trichinosis in rat
Pollay et al B96594/54 (lymph nodes—weight)
STH in guinea pig
Lanzza et al B99367/53 (histology)
STH + Adrenalectomy + Cortisol + DOCA ↑
Selye and Bois C1718/55 (lymph nodes—weight)
STH + Adrenalectomy + DOC + Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (lymph nodes)
STH + Adrenalectomy + DOCA ↑ + Ovariectomy in rat
Selye and Bois C1718/55 (lymph nodes—weight)
STH + Adrenalectomy + Aldosterone ↑ + Ovariectomy in rat
Selye and Bois C1718/55 (lymph nodes—weight)
STH + Tuberculosis in guinea pig
Chirico et al C5040/54 (lymph nodes)
FSH + Folliculoids + Sex (♂) in rat
Perry C6286/55 (lymph nodes)
TTH + Adrenalectomy + DOC + Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (lymph nodes)
Adrenalectomy in rat
Shrewsbury and Reinhardt C5956/55 (lymph nodes leucocytes in thoracic duct)
Adrenalectomy + Cortisol + DOCA + Ovariectomy + Folliculoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + Cortisol + DOCA + MAD in rat
Selye C2007/55 (lymph nodes—weight)
Adrenalectomy + Cortisol + Ovariectomy + Luteoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + Cortisol + Folliculoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + DOCA + Ovariectomy + Folliculoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + DOCA + Folliculoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + Ovariectomy + Folliculoids + Luteoids in rat
Selye et al C5677/55 (lymph nodes)
Adrenalectomy + Ovariectomy + Luteoids in rat
Selye et al C5677/55 (lymph nodes)

Adrenalectomy + Folliculoids in rat
Selye et al C5677/55
(*lymph nodes*)
Adrenalectomy + Testis extirpation + Thyroxin, in rat
Shrewsbury and Reinhardt C5956/55
(lymph nodes leucocytes in thoracic duct)
Adrenalectomy + Thyroidectomy
thyroxin in rat
Shrewsbury and Reinhardt C5956/55
(lymph nodes leucocytes in *thoracic* duct)
Adrenalectomy + Casein in rat
Hissink C1502/54 (lymph tissues)
Cortisone
Gross C4813/54 (eosinophils lymphocytes in lymph nodes—discussion)
Cortisone in guinea pig
Bodlund and Gyllensten C1315/54
(lymph node—weight)
Businco B99102/54
(lymph nodes—histology)
Kohn C756/54
(lymph nodes—histology)
Cortisone in rabbit
Businco B99102/54
(lymph nodes—histology)
Businco et al B99101/54
(lymph nodes—histology)
Schmid Bircher B99368/54
(*lymphocytes in lymph nodes*)
Cortisone ↓ in rat
Bodansky and Money B96571/54
(lymph nodes—*weight*)
Cortisone ↓ + Silicosis in rat
Stacy and King C3027/54
(*silica* in lymph nodes)
Cortisone Ø + Tuberculosis in rabbit
Freerksen C1124/54 (*lymph nodes*)
Cortisone + *Dye* in guinea pig
Nicol and Snell C4227/54
(lymph nodes—*RES*)
Cortisone + Vitamin B_1 ↑ in rat
Venkataraman et al *B99440/54*
(lymph nodes—weight)
Cortisol ↓ in guinea pig
Hausberger and Ramsay C4481/55
(lymph nodes—weight)
9α chlorocortisol 9α fluorocortisol + Nephrectomy (*partial*) + NaCl *in rat*
Selye B98967 55 (lymph nodes)
Testis extirpation + Thyroxin in rat
Shrewsbury and Reinhardt C5956/55 (lymph nodes leucocytes in *thoracic* duct)
Thyroxin in rat
Shrewsbury and Reinhardt *C5956/55*
(*lymph nodes* leucocytes in thoracic duct)

Diseases (chronic) ↓ in man
Gylling *C759/54*
(appendicular lymphatic tissues)
Trauma + Dye *in man*
Tyler et al B99414/54
(*dye retention*)
Ionizing rays (gamma) in monkey
Lushbaugh and Houck C5311/55
Ultrasound in guinea pig
Introna C4806/53 (lymph nodes)

Spleen

Spleen ← Stimuli

Hypothalamus lesion ↓ + Tuberculosis in guinea pig
Kurucz and Folgár C713/54
(tubercles)
Hypophysectomy + ACTH (intradermally intramuscularly) in rat
Bottone *B98789/54*
(weight histology)
Hypophysectomy + *STH* in rat
Cavallero and Pellegrini C1449/53
(*histology*)
Hypophysectomy + Cortisone ↓ in rat
Greenberg and Aterman B99025/54
(weight)
ACTH in fowl and pheasant
Greeley C6617/55 (weight)
ACTH ↓ *in rat*
Robbins et al C1802/55
(nucleic acid phosphorus *mitosis*)
ACTH + *STH DOCA* testoids
methyltestosterone MAD in rat
Selye C2007/55 (weight)
ACTH (to mother) Ø + Pregnancy + Age (foetal) in monkey
Schmidt and Hoffmann B96585 54
(*size*)
ACTH Ø + Trichinosis in rat
Pollay et al. B96594/54 (size)
ACTH + Casein + Potassium chloride + Protein deficiency in rat
Aschkenasy and Dray C1990/54 *C1991/53* (*weight*)
ACTH + Potassium chloride + Protein deficiency in rat
Aschkenasy and Dray B99606/54
(*weight*)
STH ↑ in mouse
Dougherty C4068/55
(*weight/body weight*)
Mirand and Hoffman C4396/55
(weight)
STH Ø in rabbit
Bunn and *Robinson* B98489/54
(weight)
STH in rat
Conti B98675/54 (*weight*)
Matteini and Marabini B93837/53
(weight)

STH+Adrenalectomy in mouse
Dougherty C4968/55 (weight)
STH Ø+Adrenalectomy+Cortisol in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+Cortisol+DOCA ↑
Selye and Bois C1718/55 (weight)
STH+Adrenalectomy+Cortisol+DOCA+Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH+Adrenalectomy+Cortisol+Ovariectomy in rat
Bois and Selye C4580/55 (weight)
STH+Adrenalectomy+DOC+Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (weight)
STH ↑+Adrenalectomy+DOCA in rat
Selye B100000/54 (weight)
STH+Adrenalectomy+DOCA+Ovariectomy in rat
Bois and Selye C4580/55 (weight)
Selye and Bois C1718/55 (weight)
STH+Adrenalectomy+Aldosterone ↑+Ovariectomy in rat
Selye and Bois C1718/55 (weight)
STH+Adrenalectomy+NaCl, in rat
Bois and Selye C4580/55 (weight)
Selye B100000/54 (weight)
STH+MAD+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54 (weight)
STH+Alloxan in rat
Malandra et al C5085/53 (weight)
STH ↓+*Tuberculosis in guinea pig*
Besta et al B99116/54 (tuberculosis)
STH+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
STH+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
STH+Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
GTH+Adrenalectomy in rat
Mandl C285/54 (weight)
TTH+Adrenalectomy+DOC+Gonadectomy in mouse
Nagareda and Kaplan C4401/55 (weight)
Adrenalectomy+Cortisone in rat
Kief et al C2418/54 (histology)
Adrenalectomy+Cortisone+Testis extirpation in rat
Trémolieres et al C1924/54 (weight)
Adrenalectomy+Cortisol in rat
Bois and Selye C4580/55 (weight)

Adrenalectomy+Cortisol+DOCA+Ovariectomy+Folliculoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Cortisol+DOCA+MAD in rat
Selye C2007/55 (weight)
Adrenalectomy+Cortisol+DOCA+Diet in rat
Ventura C5857/55 (weight)
Adrenalectomy+Cortisol+DOCA+Starvation in rat
Ventura and Selye C1531/55 (weight)
Adrenalectomy+Cortisol+Aldosterone ↑ in rat
Selye B98268/55 C1451/55 (weight)
Adrenalectomy+Cortisol+Ovariectomy+Luteoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Cortisol+Folliculoids in rat
Selye et al. C5677/55 (weight)
Adrenalectomy+Cortisol+MAD in rat
Selye C2007/55 (weight)
Adrenalectomy+Cortisol+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54 (weight)
Adrenalectomy+Cortisol+NaCl in rat
Selye C2008/55 (weight)
Adrenalectomy+Cortisol+Diet in rat
Ventura C5857/55 (weight)
Adrenalectomy+DOCA in rat
Bois and Selye C4580/55 (weight)
Kief et al C2418/54 (histology)
Adrenalectomy+DOCA+Ovariectomy+Folliculoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+DOCA+Folliculoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+DOCA+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (weight)
Adrenalectomy+DOCA+Diet in rat
Ventura C5857/55 (weight)
Adrenalectomy+Cpd B ↓ in rat
Fruhman and Gordon C1902/55 (weight)
Adrenalectomy+Ovariectomy+Folliculoids+Luteoids in rat
Selye et al. C5677/55 (weight)
Adrenalectomy+Ovariectomy+Luteoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+Folliculoids in rat
Selye et al C5677/55 (weight)
Adrenalectomy+MAD+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (weight)

Adrenalectomy+Starvation in rat
Ventura and Selye C1531/55 (weight)
Adrenal transplant in rabbit
Binda and Possenti B93466/53 (histology)
Adrenaline in cat
Lippay et al B99153/53 (contraction in vitro)
Adrenaline Ø in rat
Fekete and Prókai C3200/54 (weight)
Cortisone in fowl
Greeley C6617/55(weight)
Cortisone in guinea pig
Busınco B99102/54 (histology)
Cortisone in pheasant
Greeley C6617/55 (weight)
Cortisone in rabbit
Businco B99102/54 (histology)
Businco et al B99101/54 *(histology)*
Schmid Bircher B99368/54 (histology)
Cortisone (long term) in rabbit
Constantinides et al C2743/55 (weight)
Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55 (weight)
Cortisone ↓+Age (immature) in rat
Mandl C285/54 (weight)
Cortisone ↓+*Salmonella* in rat
Chedid et al B99547/54 (weight)
Cortisone ↑+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (weight, tuberculosis)
Cortisone ↑+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
Cortisone+Dye in guinea pig
Nicol and Snell C4225/54 (RES)
Cortisone+Protein ↑ in rat
Tremolieres et al C1924/54 (weight)
Cortisone+Vitamin B_1 ↑ in rat
Venkataraman et al B99440/54 (weight)
Cortisone+Diet in hamster
Knigge C3678/55 (weight)
Cortisone+Starvation in *hamster*
Knigge C3678/55 (weight)
Cortisone+Protein deficiency in rat
Aschkenasy *C1988/54 (weight)*
Cortisol in rat
Bois and Selye C4580/55 (weight)
Cortisol+*DOCA in rat*
Bois and Selye C4580/55 (weight)
9α chlorocortisol 9α fluorocortisol+Nephrectomy (*partial*)+*NaCl* in rat
Selye B98967/55 (weight)

DOCA in rabbit
Binda and Possenti B93466/53 (histology)
DOCA+Folliculoids in rat
Conti B98675/54 (weight)
DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Folliculoids+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (weight tuberculosis)
DOCA+*Tuberculosis+Isonicotinic acid* hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
DOCA+Diet in hamster
Knigge C3678/55 (weight)
DOCA+Starvation in hamster
Knigge C3678/55 (weight)
Folliculoids ↓ in mouse
Lavenda and Wong B99390/54 (weight/body weight)
Folliculoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Testis extirpation+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Testoids ↓ in mouse
Lavenda and Wong B99390/54 (weight/body weight)
Testoids ↓+Age (immature) in fowl
Layne and Common C6767/55 (weight)
Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 *C1991/53 (weight)*
Testoids+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
MAD+Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (weight)
Thyroidectomy+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Thiourea ↓ in rat
Freedman and Gordon C1799/55 (weight/body weight)
Thiourea ↑+Protein in rat
Aragona and Barone C2101/53 (fibrosis)

Thyroxin + Casein + Protein deficiency in rat
Aschkenasy and Dray B1990/54 B1991/53 (weight)
Thyroxin + Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight/body weight)
Glucagon ↑ in rat
Cavallero et al C2038/53 (weight)
Thymectomy Ø in rat
Shibata et al. B97619/52 (weight)
Thymus extract ↑ in rat
Matteini and Marabini B99837/53 (weight)
Lymph node extract, in rat
Matteini and Marabini B99837/53 (weight)
Liver extract in rat
Matteini and Marabini B99837/53 (weight)

Spleen ← Stressors

Trauma burns in man
Sevitt C3627/55 (eosinophils)
Ionizing rays ↓ in mouse
Rugh B98033/54 (dry weight)
Ionizing rays + Thorotrast in rat
Gabrieli and Auskaps B99152/53 (RES)
Caseinate + Nitrogen mustard ↑ in mouse
Teilum B96738/54 (amyloid)
Heparin ↓ in rabbit
de Matteis B97550/54 (weight)
Pyromen in rat
Wexler C6135/54 (weight)
Starvation in fowl
Greeley C6617/55 (weight)
Starvation in hamster
Knigge C5678/55 (weight)
Starvation in pheasant
Greely C6617/55 (weight)
Starvation in rat
Ventura and Selye C1531/55 (weight)
Protein deficiency in rat
Aschkenasy C1988/54 (weight)

Bone Marrow

Generalities
Aschkenasy C1988/54 (hematopoiesis—review)
Gordon B98602/54 (review)

Bone Marrow ← Various

Hypophysectomy + Cortisone in rat
Gordon B98602/54 (histology)
Hypophysectomy + Blood (plasma filtrate of anemic rabbit) in rat
Gordon et al C6291/55 (histology)
Hypophysectomy + Carcinogen in rat
Richardson et al C2406/53
Hypophysectomy + Colchicine in rat
Marinone and Corso C4265/55 (histology mitosis)
Hypophyseal anterior lobe extract in man
Pansini C130/53
ACTH ↑↓
Uhrbrand B99245/54 (eosinophils)
ACTH in man
Pansini C130/53
ACTH in rat
Bounameaux C1982/54 (mitosis megakaryocytes)
Pollay et al B96594/54 (myelocytic hyperplasia)
Robbins et al C1802/55 (nucleic acid phosphorus mitosis)
ACTH Ø + Pregnancy in monkey
Schmidt and Hoffmann B96565/54
ACTH (to mother) Ø + Pregnancy + Age (foetal) in monkey
Schmidt and Hoffmann B96565/54
ACTH + Ascorbic acid deficiency in guinea pig
Pihero and Gordon C3062/54 (histology)
STH in man
Pansini C130/53
Sacchetti and Bianchini B99256/53 (in vitro)
Sforzini and Negri C3215/54 (histology)
STH + Adrenalectomy + Cortisone + Ionizing rays in rat
Betz C5951/55 (histology)
Adrenalectomy + Corticoids in rat
Gordon B98602/54 (histology)
Adrenalectomy + Cortisone + Ionizing rays in rat
Betz C5951/55 (histology)
Adrenalectomy + Cortisol ↓ in rat
Gordon C3421/55 (*lymphocytes eosinophils*)
Adrenalectomy + Cortisol ↑ in rat
Gordon C3421/55 (erythrocytes)
Adrenalectomy + Cpd B in rat
Fruhman and Gordon C1902/55 (histology)
Adrenalectomy + Testoids + Ionizing rays in rat
Betz C5951/55 (histology)
(Adrenalectomy + NaCl) ↓ in rat
Gordon C3421/55 (erythrocytes)
(Adrenalectomy + NaCl) ↑ in rat
Gordon C3421/55 (lymphocytes eosinophils)
Cortisone
Gross C4613/54 (eosinophils lymphocytes—discussion)

Adrenalectomy+Starvation in rat
Ventura and Selye C1531/55 (weight)
Adrenal transplant in rabbit
Binda and Possenti B93466/53 (histology)
Adrenaline in cat
Lippay et al B99153/53 (contraction in vitro)
Adrenaline Ø in rat
Fekete and Prokai C3200/54 (weight)
Cortisone in fowl
Greeley C6617/55(weight)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone in pheasant
Greeley C6617/55 (weight)
Cortisone in rabbit
Businco B99102/54 (histology)
Businco et al B99101/54 (histology)
Schmid Bircher B99368/54 (histology)
Cortisone (long term) in rabbit
Constantinides et al C2743/55 (weight)
Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55 (weight)
Cortisone ↓+Age (immature) in rat
Mandl C285/54 (weight)
Cortisone ↓+*Salmonella* in rat
Chedid et al B99547/54 (weight)
Cortisone ↑+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (weight, tuberculosis)
Cortisone ↑+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
Cortisone+Dye in guinea pig
Nicol and Snell C4225/54 (RES)
Cortisone+Protein ↑ in rat
Tremolieres et al C1924/54 (weight)
Cortisone+Vitamin B_1 ↑ in rat
Venkataraman et al B99440/54 (weight)
Cortisone+Diet in hamster
Knigge C3678/55 (weight)
Cortisone+Starvation in hamster
Knigge C3678/55 (weight)
Cortisone+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Cortisol in rat
Bois and Selye C4580/55 (weight)
Cortisol+DOCA in rat
Bois and Selye *C4580/55 (weight)*
9 chlorocortisol 9α fluorocortisol+Nephrectomy (partial)+NaCl in rat
Selye B98967/55 *(weight)*

DOCA in rabbit
Binda and Possenti B93466/53 (histology)
DOCA+Folliculoids in rat
Conti B98675/54 (weight)
DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Folliculoids+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Age (senile) in rat
Korenchevsky et al C5575/53 (weight)
DOCA+Tuberculosis in guinea pig
Besta and Valenti B99115/52 *B99119/53 (weight tuberculosis)*
DOCA+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
DOCA+Diet in hamster
Knigge C3678/55 (weight)
DOCA+Starvation in hamster
Knigge *C3678/55 (weight)*
Folliculoids ↓ in mouse
Lavenda and Wong B99390/54 (weight/body weight)
Folliculoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
Testis extirpation+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Testoids ↓ in mouse
Lavenda and Wong B99390/54 *(weight/body weight)*
Testoids ↓+Age (immature) in fowl
Layne and Common C6767/55 *(weight)*
Testoids+Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54 *C1991/53* (weight)
Testoids+Protein deficiency in rat
Aschkenasy *C1988/54 (weight)*
MAD+Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (weight)
Thyroidectomy+Protein deficiency in rat
Aschkenasy C1988/54 (weight)
Thiourea ↓ in rat
Freedman and Gordon C1799/55 (weight/body weight)
Thiourea ↑+Protein in rat
Aragona and Barone C2401/53 (fibrosis)

CARDIOVASCULAR SYSTEM

(For earlier pertinent data cf also *Stress* pp 489 600 AROS 1951 pp 312 348 AROS 1952 pp 210-223 AROS 1953 pp 265 301 AROS 1954 pp 449-463)

Generalities
Gregg C3430/55
(heart function review)
Matthes C3429/55
(peripheral circulation—review)
Page C862/54 (neural and humoral control of vessels—review)

CARDIOVASCULAR SYSTEM ← STIMULI

Spinal cord section+Hypophysectomy+Potassium (intracisternally) Ø veratrum (intracerebral) Ø in dog
Cicardo B97566/53 (blood pressure)

Spinal cord section+Nephrectomy+Peritoneal lavage in dog
Kolff et al B97915/54
(vessels blood pressure)

Spinal cord section+ABA (various)+Anesthetic in dog
Page et al C1600/54 (function)

Spinal cord section+Potassium (intracisternally) ↑ veratrum (intracerebral) ↑ in dog
Cicardo B97565/53 (blood pressure)

Nerves (sleep) in man
Mangold et al C6779/55 (blood flow in brain blood pressure)

Nerves (brain stimulation) in dog
Morin and Corriol B99160/53
(blood pressure)

Nerves (brain stimulation)+ABA (various) in dog
McQueen et al B99146/54
(blood pressure)

Nerves (brain stimulation)+Anesthetic in dog
McQueen et al B99146/54
(blood pressure)
Morin and Corriol B99160/53
(blood pressure)

Sympathectomy+Adrenalectomy+Trauma (locally) in hamster
Copley and Stefko C533/54
(vessel contraction)

Sympathectomy+Adrenal demedullation in dog
Richards et al B98331/53
(heart function blood pressure)

Sympathicus stimulation (splanchnicus or renal artery nerve) ↑ in dog
Kubicek et al B97916/54
(blood pressure)

Sympathicus stimulation+Adrenalectomy in dog
Santenoise et al C1091/49
(blood pressure)

Sympathicus stimulation+ABA (various) in dog
Cicardo and Dutrey C4926/54
(blood pressure)

Vagus stimulation (central) ↑+Adrenalectomy in dog
Cicardo B97564/53 (blood pressure)

Vagus stimulation (central)+Adrenalectomy+ABA (various) ↓ in dog
Cicardo B97564/53 (blood pressure)

Vagus stimulation+Parabiosis (cross circulation) in dog
Diaz et al B98143/54
(blood pressure)

Nerves (depressor nerves+carotid sinus extirpation)+Hypophysectomy in dog
Bekaert C4661/54 (blood pressure)

Denervation (pressoreceptor)+Noradrenaline in dog
Hilton and Brown B97911/54
(blood pressure)

Hypothalamus stimulation+Adrenalectomy in rabbit
Kurotsu et al. C2006/54
(blood pressure)

Hypothalamus stimulation+Adrenaline noradrenaline+Rauwolfia in cat
Harrison and Goth C5261/55
(heart function blood pressure)

Hypothalamus stimulation+ABA (dibenamine) ↓ in cat
Conley and Gellhorn C2073/53
(blood pressure)

Hypothalamus stimulation+ABA (various) in dog
McQueen et al B99146/54
(blood pressure)

Hypothalamus stimulation+Anesthetic in dog
McQueen et al B99146/54
(blood pressure)

Hypothalamus Hypophysis irradiation (ionizing) ↑ in man
Hecht et al B96455/53
(capillary permeability)

Hypophysectomy+LAP+ACTH+DOCA+Nephrectomy (partial)+NaCl in rat
Salgado B99121/54 C1002/54
(heart vessels blood pressure)

Hypophysectomy+ACTH+STH+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)

Cortisone in guinea pig
Businco B99102/54 (histology),
Yoffey et al B97950/54 (specific gravity of bone marrow differential cell count erythroid/myeloid ratio)
Cortisone ↓ in mouse
Morsiani and Lucci B98017/53
(number of mitoses)
Cortisone in rabbit
Businco B99102/54 (histology)
Cortisone ↓ in rabbit
Schmid Bircher B99368/54
(hemopoietic elements)
Cortisone in rat
Bounameaux C1982/54
(mitosis megakaryocytes)
Cortisol in guinea pig
Yoffey et al B97950/54 (specific gravity of bone marrow differential cell count)
DOC (free alcohol) in rat
Fruhman and *Gordon C3622/54*
(histology)
Cpd A ↑ in guinea pig
Yoffey et al B97950/54
(granulocytes)
Testoids + Ionizing rays in rat
Betz C5931/55 (histology)
Salicylate in rat
Bounameaux C1982/54
(mitosis megakarocytes)

Hemopoietic Diseases

Aplasia of bone marrow → Hypothalamus
(histology)
Bracali C2442/54
Dyssplenism (secondary) ← ACTH and/or cortisone
Reinhard and Loeb C6431/55
Erythraemic myelosis (di Guglielmo) ← ACTH
Wegelius and Peltonen C2517/54
Erythrocytic hypoplasia ← ACTH + Splenectomy
Tsai and Levin B99516/54
Hodgkin s disease–review
Kaplan B97941/54
Hodgkin s disease ← *ACTH* and/or cortisone
Bock B99560/53
Gellhorn C5608/55 (discussion)
Marchal and Duhamel *C5652/55*
(discussion)
Marchal et al C3905/54
Pearson et al *C6224/55*
(discussion)
Scalabrino and Bianchi C2878/53
Hodgkin s disease ← ACTH + Antibiotic
Giraud et al C4840/54
Hodgkin s disease → Amyloid in tissues ← Nitrogen mustard ↑
Teilum B96738/54

Hyperfunction of thymus ↑ → Lymphocytes in blood
Knodgen C1282/53
Hyperfunction of thymus ↓ →
Blood pressure
Knodgen C1282/53
Hyperfunction of thymus ↑ → Pulse rate
Knodgen C1282/53
Hypofunction of thymus ↓ → Lymphocytes *in blood*
Knodgen C1282/53
Hypofunction of thymus ↑ →
Blood pressure
Knodgen C1282/53
Hypofunction of thymus ↓ → Pulse rate
Knodgen C1282/53
Lymphadenosis ← Sympathectomy +
Vagotomy
Kellermann C4179/55
Multiple myeloma ← ACTH and/or cortisone
Diamond B96491/53
Fadda et al C583/53
Forster and Moeschlin C636/54
(extramedullary leukemic)
Francisco et al C6046/53
Geller B97528/54 (discussion)
di Guglielmo C3703/54
Marchal et al C6704/54
Pearson et al C6224/55
(discussion)
Peruzzi and Palma B97493/53
Multiple myeloma ← Folliculoids
Wigand B98733/53
Multiple myeloma → *Body weight* ← Folliculoids ↑
Wigand B98733/53
Plasmoreticular reticulosis → Hypophysis *adrenals*
Kovacs and Korpassy C5877/54
(histology)
Status thymolymphaticus–Pathogenesis
(adrenals acetylcholine)
Sáry and Porszasz C2133/54
Status thymolymphaticus ↓ → Resistance
Trillot et al B96724/53
Status thymolymphaticus → Adrenals
(congestion)
Trillot et al B96724/53
Thymus tumor ← ACTH and/or cortisone
Schermann C4435/55 (discussion)
Thymus tumor → Reticulocytes in blood ← ACTH + Thymus tumor extirpation + Splenectomy
Chalmers and Boheimer C698/54
Thymus tumor → Hemoglobin ← ACTH + *Thymus tumor extirpation +* Splenectomy
Chalmers and Boheimer C698/54

STH+Cortisone+Fasting in dog
Wilhelmj et al. C5341/55
(capillary resistance)
STH+Testoids+Choline deficiency in rat
Wilgram et al. C5169/55
(heart, vessels)
STH+MAD+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54
(heart vessels blood pressure)
STH+Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado B98385/54 (heart weight)
C1002/54 (heart, vessels blood pressure)
STH+Nephrectomy (partial)+NaCl in rat
Salgado B98385/54 (heart lesion)
STH ↑+ Nephrectomy (partial)+NaCl in rat
Salgado B98385/54
(heart weight, blood pressure)
FSH+Folliculoids+Sex (♂) in rat
Perry C6288/55 (periarteritis nodosa)
TTH+Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado B98385/54 (heart weight)
C1002/54 (heart vessels blood pressure)
TTH+Nephrectomy (partial)+NaCl, in rat
Salgado B98385/54 C1002/54
(heart vessels blood pressure)
TTH ↑+ Nephrectomy (partial)+NaCl in rat
Salgado B98385/54
(heart weight blood pressure)
Hypophyseal posterior lobe extract+DOCA+Nephrectomy (partial) in rat
Friedman et al C2470/55
(blood pressure)
Vasopressin+Adrenalectomy+Adrenaline (locally) in rat
Zweifach and Metz C4568/55
(vessel contraction)
Vasopressin+Noradrenaline in rat
von Sallmann et al C1070/54
(blood pressure)
Vasopressin+Cortisol+DOCA, in rat
Friedman and Friedman C5090/55
(blood pressure)
Vasopressin+Cortisol+Nephrectomy (partial)
Friedman et al C5696/55
(blood pressure)
Vasopressin+DOCA, in rat
Friedman and Friedman C5090/55
(blood pressure)
Friedman et al. B99400/54
(blood pressure)
Vasopressin+DOCA+Nephrectomy (partial) in rat
Friedman et al C2470/55 C5696/55
(blood pressure)
Vasopressin+DOCA+Nephrectomy (partial)+NaCl, in rat
Page and Glendening C5444/55
(blood pressure vessels)
Vasopressin+Nephrectomy (partial)+ERH (figure-of eight ligature) in rat
Friedman et al. C4843/55
(blood pressure)
Vasopressin+Hypertension (experimental, spontaneous) in rat
Friedman and Friedman C5090/55
(blood pressure)
Vasopressin+Hemorrhage in dog
Frank et al C4138/55
(blood pressure)
Vasopressin+Hibernation (artificial) in man
Spitzbarth et al. C3723/55
(blood pressure)
Oxytocin+DOCA+Nephrectomy (partial) in rat
Friedman et al. C2470/55
(blood pressure)
Adrenalectomy ↓ in cat
Sáry and Pórszász C2133/54
(blood pressure)
Adrenalectomy in dog
Collings and Decker C5067/55
(heart function)
Adrenalectomy in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Hoagland B98593/54
(head blood flow)
Adrenalectomy+Adrenaline (locally) in rat
Zweifach and Metz C4568/55
(vessel contraction)
Adrenalectomy+Adrenaline, noradrenaline+Histamine ↑ in cat
Bein and Meier B96657/53
(blood pressure)
Adrenalectomy+Adrenaline noradrenaline+Nicotine nikethamide in cat
Bein and Meier B96657/53
(blood pressure)
Adrenalectomy+Adrenaline (locally)+Noradrenaline renin in rat
Zweifach and Metz C4568/55
(vessel contraction)
Adrenalectomy+ACE in rat
Hoagland B98593/54
(head blood flow)
Renkin and Zaun C4844/55
(capillary permeability)

Hypophysectomy+STH+LTH+
Ovariectomy+Folliculoids+
Luteoids in rat
Souders C5152/55 (heart weight)
Hypophysectomy+STH+DOCA+
Thyroxin+Nephrectomy (partial)+
NaCl in rat
Salgado B99121/54 C1002/54
(heart vessels blood pressure)
Hypophysectomy+Cortisone ↑ in rat
Greenberg and Aterman B99025/54
(heart weight/body weight)
Hypophysectomy+Cortisone+DOCA+
Nephrectomy (partial)+NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)
Hypophysectomy+DOCA+Thyroxin+
Nephrectomy (partial)+NaCl
in rat
Salgado C1002/54
(heart vessels blood pressure)
Hypophysectomy+DOCA+Nephrectomy
(partial)+NaCl in rat
Salgado B99121/54
(heart vessels blood pressure)
Hypophysectomy+Thyroxin ↑ in rat
Seow B97432/54 (heart weight)
Hypophysectomy+Nephrectomy (partial)+
ERH (cellophane wrapping)
in rat
Eger B98259/53 (heart/weight)
Hypophysectomy+Drugs (SC-4473
SC 3402) in rat
Sturtevant C2752/55 (heart weight)
LAP in rat
Besnak C4972/55 (heart weight)
ACTH in man
Sjostrand C4687/54
(ECG—discussion)
ACTH ↓ in man
Vernuory C3938/54
(capillary permeability)
ACTH ↑ in rat
Bergmann C6760/55
(blood pressure)
ACTH+STH+Nephrectomy (partial)+
NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)
ACTH+Adrenalectomy+Hemorrhage
in dog
Frank et al. C4138/55
(blood pressure)
ACTH+Adrenaline in rat
von Sallmann et al C1070/54
(blood pressure)
ACTH+Adrenaline+Starvation in rat
Balourdas C5046/55 (capillary
blood flow capillary permeability
vessel contraction)
ACTH+Noradrenaline in rat
von Smallmann et al C1070/54
(blood pressure)

ACTH+DOCA+Nephrectomy (partial)+
NaCl in rat
Page and Glendening C5444/55
(blood pressure vessels)
ACTH Ø+Folliculoids+Age (immature)
+Cholesterol in fowl
Stamler et al B98522/54
(coronary atherogenesis)
ACTH Ø+Pregnancy in monkey
Schmidt and Hoffmann B96565/54
(heart)
ACTH (to mother) Ø+Pregnancy+
Age (foetal) in monkey
Schmidt and Hoffman B96565/54
(heart)
ACTH+Race (African) in man
Barnicot and Ladell C462/54
(blood pressure)
ACTH+Acetylcholine in rat
von Sallmann et al. C1070/54
(blood pressure)
ACTH+Cholesterol in rabbit
Wang et al C6316/55
(atherosclerosis)
ACTH+NaCl (withdrawal)
Bagnall and Robinson B99524/54
(blood pressure)
ACTH ↑+Diet (carbohydrates) in dog
Wilhelmj et al B96734/54
(capillary resistance)
ACTH+Starvation in rat
Balourdas C5046/55 (capillary
blood flow capillary permeability
vessel contraction)
STH in dog
Wilhelmj et al C5841/55
(blood pressure heart rate)
STH ↓ in dog
Gunderson et al C1629/54
(capillary resistance)
STH ↑ in dog
Gunderson et al C1629/54
(blood pressure)
STH Ø in guinea pig
Lanzza et al B99367/53
(heart histology)
STH in rat
Besnak C4972/55 (heart weight)
Constantinides and Rutherdale
C2644/54 (mast cells in heart)
STH+Cortisone in dog
Wilhelmj et al C5841/55
(blood pressure heart rate)
STH+Cortisone ↓ in dog
Gunderson et al C1629/54
(blood pressure)
STH+Cortisone ↑ in dog
Gunderson et al C1629/54
(capillary resistance)
STH+Cortisone+Diet, in dog
Wilhelmj et al. C5841/55
(capillary resistance)

Adrenalectomy+ABA (dibenamine)+
Potassium (intracysternally) ↑
in dog
Cicardo B97565/53 (blood pressure)
Adrenalectomy Ø+Calcium chloride in rat
Malinow et al B96633/53
(heart irregularities)
Adrenalectomy ↓+Cardiazol in dog
Cicardo B98562/54 (blood pressure)
Adrenalectomy+Cysteine+Histamine ↑
nicotine Ø nikethamide ↑ in cat
Bein and Meier B96637/53
(blood pressure)
Adrenalectomy ↓+Dextran in rat
Halpern C5664/54 (blood pressure)
Adrenalectomy+Histamine Ø in cat
Bein and Meier B96537/53
(blood pressure)
Adrenalectomy ↓+*Latrodectus mactans extract in dog*
Cicardo B98563/54 (blood pressure)
Adrenalectomy+Nicotine Ø
nikethamide Ø in cat
Bein and Meier B96637/53
(blood pressure)
Adrenalectomy+Potassium
(intracisternally) ↑ in dog
Cicardo B97564/53 (blood pressure)
Adrenalectomy ↓+Potassium+
Potassium deficiency in rat
Freed et al C1081/54
(blood pressure)
Adrenalectomy Ø+Serotonin
Page and McCubbin B96654/53
(blood pressure)
Adrenalectomy+Thiocholine (acetyl ester)
Marquardt and Vogg B98008/53
(blood pressure)
Adrenalectomy+Veratrum (intracister-
nally) ↑ in dog
Cicardo B97565/53 (blood pressure)
Adrenalectomy+Parabiosis in rat
Hoelscher B99401/54 C2463/55
(heart weight heart function
blood pressure) C1633/54
(cardiac output)
Adrenalectomy (partial)+Adrenal venous
ligature in rat
Delille et al C4924/54
(blood pressure)
Adrenalectomy (partial)+Adrenal transplant
+Medullosclerosis in rabbit
Binda and Possenti B93467/55
(vessels)
Adrenal demedullation+Adrenaline
in rat
Crismon and Dryer C2458/55
(vessel contraction)
Adrenal demedullation+Histamine releaser
(cpd 48/80) in rat
Nasmyth C4608/55 (blood pressure)

Adrenal transplant in rabbit
Binda and Possenti B93466/53
(vessels)
Adrenaline in dog
Dorner C3203/54 (heart failure
blood flow blood pressure)
Imagawa B99027/54
(blood pressure)
O Brien et al C1644/54 (heart rate)
Pezzuoli and Belli B97996/52
(pulmonary blood pressure)
Adrenaline in man
Vellacott C6261/55
(vessel contraction)
Adrenaline ↑ in rabbit
Fishback C4795/50
(circulation time)
Magyar et al C6474/55
(development of arteriosclerosis)
Adrenaline in rat
Fekete and Prokai C3200/54
(heart weight)
Adrenaline+Noradrenaline
West C4904/54
(vessel contraction—discussion)
Adrenaline+Cortisone in rabbit
Dury and Moss C1617/54 (aorta)
Adrenaline+Cortisone+Nephrectomy
(partial)+Kidney ligature in rat
Rosenman et al C441/54
(blood pressure)
Adrenaline+Cortisone+Starvation in rat
Balourdas C5046/55 (capillary
blood flow capillary permeability
(vessel contraction)
Adrenaline+DOCA in rat
Page and Glendening C5444/55
(blood pressure vessels)
Adrenaline+DCG ↓+Muscular exercise
in man
Schumann B99496/52
(ECG changes)
Adrenaline+Sex Ø in rat
Crismon and Dryer C2459/55
(vessel contraction)
Adrenaline+Nephrectomy (partial)+
ERH (kidney vessel ligature)+
Renin (repeated until tachyphylaxis)
in cat
Schapiro C1652/54 (blood pressure)
Adrenaline+Nephrectomy+Blood
(of hypertensive dog) Ø in dog
Coverts et al C3325/55
(blood pressure)
Adrenaline+ERH (kidney vessel ligature)
in rabbit
Rothman C2471/55 (blood pressure)
Adrenaline+Heredity in rat
Crismon and Dryer C2458/55
(vessel contraction)
Adrenaline+Cerebral hypertension
(ligation of carotids) in rabbit
Rothman C2471/55 (blood pressure)

Adrenalectomy + Cortisone (maintenance doses) in dog
Swingle et al C273/54
(blood pressure)
Adrenalectomy + Cortisone in rat
Frule C4666/53
Hoagland B98593/54
(head blood flow)
Adrenalectomy + Cortisone + DOCA + Nephrectomy (partial) + Ascorbic acid Ø in rat
Bergeron et al C4660/54
(blood pressure)
Adrenalectomy + Cortisone + Testis extirpation in rat
Tremolieres et al C1924/54
(heart weight)
Adrenalectomy + Cortisone + Nephrectomy (partial) + Ascorbic acid Ø in rat
Bergeron et al C4660/54
(blood pressure)
Adrenalectomy + Cortisone withdrawal ↓ in man
Mendelsohn and Pearson C3575/55
(blood pressure)
Adrenalectomy + Cortisone withdrawal ↓ + Nephrectomy (partial) in rat
Bergeron et al C4660/54
(blood pressure)
Adrenalectomy + Cortisol (maintenance doses) in dog
Swingle et al C273/54
(blood pressure)
Adrenalectomy + Cortisol (i v) in man
Rukes et al C6231/55
(blood pressure)
Adrenalectomy + Cortisol + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)
Adrenalectomy + 9α chlorocortisol 9α fluorocortisol in dog
Swingle et al C2760/55
(blood pressure)
Adrenalectomy + DOC (maintenance doses) in dog
Swingle et al C273/54
(blood pressure)
Adrenalectomy + DOC ↑ in rat
Hoagland B98593/54
(head blood flow)
Adrenalectomy + DOCA in rat
Gross et al B99957/55
(heart–histology)
Schieffarth and Berg B99768/53
(heart–histology)
Adrenalectomy + DOCA + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54
(heart vessels *blood pressure)*

Adrenalectomy + DOCA + Nephrectomy (partial) + Ascorbic acid Ø in rat
Bergeron et al C4660/54
(blood pressure)
Adrenalectomy + DOCA + Nephrectomy (partial) + NaCl in rat
Gross et al B99957/55
(heart–histology blood pressure)
Adrenalectomy + DOCA + Renin in rat
Silva and Crovatto B97552/52
(blood pressure)
Adrenalectomy + DOCA + Serum in rat
Scheiffarth and Berg B99768/53
(heart–histology)
Adrenalectomy + DOCA withdrawal ↓ in dog
Swingle et al B97928/54
(blood pressure)
Adrenalectomy + Aldosterone (maintenance doses) in dog
Swingle et al C273/54
(blood pressure)
Adrenalectomy + Aldosterone Ø + Nephrectomy (partial) + NaCl in rat
Gross et al B99957/55
(blood pressure)
Adrenalectomy + 9α fluorocorticosterone in dog
Swingle et al C2780/55
(blood pressure)
Adrenalectomy + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)
Adrenalectomy + Δ pregnenolone ↑ in rat
Hoagland B98593/54
(head blood flow)
Adrenalectomy ↓ + Renin in rat
Silva and Crovatto B97552/54
(blood pressure)
Adrenalectomy + Periost stimulation *in rabbit*
Piana C3232/47
(heart function blood pressure)
Adrenalectomy + Asphyxia ↑ in dog
Cicardo B97564/53 (blood pressure)
Adrenalectomy + Asphyxia + ABA (various) ↓ in dog
Cicardo B97564/53 (blood pressure)
Adrenalectomy + Serologic reactions + Anesthetic in mouse
McMaster et al C3983/51
(vessel contraction)
Adrenalectomy + Serum in rat
Scheiffarth and Berg B99788/53
(heart–histology)
Adrenalectomy + ABA (various) ↓ + Potassium (intracisternally) in dog
Cicardo B97564/53 (blood pressure)

Noradrenaline+Nephrectomy in dog
Vanatta et al. C5161/55 (blood pressure)

Noradrenaline+ERH (kidney vessel ligature) in rabbit
Rothman C2471/55 (blood pressure)

Noradrenaline+ERH (kidney vessel ligature)+*Drugs* (*sulfur containing*) in rat
Schroeder et al C4175/55 (blood pressure)

Noradrenaline+ERH (kidney vessel ligature)+Mercaptane derivatives in rat
Schroeder et al. C4175/55 (blood pressure)

Noradrenaline (locally to carotid sinus)+Hypertension (experimental) in dog
Matton C5446/54 (blood pressure)

Noradrenaline+Cerebral hypertension (ligation of carotids) in rabbit
Rothman C2471/55 (blood pressure)

Noradrenaline+Shock (cardiogenic experimental) in dog
Collier et al C5243/55 (heart vessels)

Noradrenaline+Hibernation (artificial) in man
Spitzbarth et al. C37[illegible]3/55 (blood pressure)

Noradrenaline+ABA (dibenamine) ↓ in cat
Conley and Gellhorn C[illegible]073/53 (blood pressure)

Noradrenaline+ABA (various) in man
Bernsmeier and Becker B96468/53 (blood pressure pulse rate)

Noradrenaline+ABA (chlorpromazine) in man
Foster et al. B98211/54 (heart rate blood pressure vessel contraction)

Noradrenaline+ABA (hydrazine derivatives) ↓ in rat
Schroeder B98808/54 (blood pressure)

Noradrenaline+Aramine in man
Madonia et al C3343/54 (blood pressure heart rate)

Noradrenaline+Mecholyl, in man
Funkenstein and Meade C3733/54 (blood pressure)

Noradrenaline+Parabiosis (cross circulation) in dog
Diaz et al. B98143/54 (blood pressure)

Adrenaline derivatives (adrenochrome) in man
Sherber B97408/53 (bleeding)

ACE Ø in rat
Constantinides and Rutherdale *C2644/54* (mast cells in heart)

Corticoids
Kuchmeister and Pirtkien C586/54 (capillary permeability capillary pressure)

Cortisone (intracisternally) in cat
Samueloff and Feldman C5064/54 (blood pressure)

Cortisone in dog
Magida and Lubschez C639/54 (ECG)
Wilhelmj et al. C5841/55 (blood pressure heart rate)

Cortisone ↑ in dog
Gunderson et al C1629/54 (capillary resistance)

Cortisone in frog
Hoffmann C846/54 (heart function in vitro) C3101 (heart contraction in vitro)
Scalabrino et al. C565/54 (ECG in vitro)

Cortisone in guinea pig
Businco B99102/54 (heart, vessels)
Hoffmann C846/54 (heart function in vitro) C3101 (heart contraction in vitro)
Jones and Carter C5899/54 (heart valves)

Cortisone in man
Bean et al. C6777/55 (blood pressure)
Sjostrand C4687/54 (ECG–discussion)
Wold C4014/54 (function)

Cortisone (percutaneously) ↑ in man
Pirtkien and Kuchmeister C1865/54 (capillary blood pressure capillary contraction)

Cortisone in rabbit
Businco B99102/54 (heart vessels)
Scalabrino et al. C565/54 (ECG in vitro)
Schwartz et al. B99529/54 (vessels in cornea)

Cortisone (long term) in rabbit
Constantinides et al. C2743/55 (vessels)

Cortisone ↓ in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)

Cortisone ↑ in rat
Gaunt et al B97572/54 (blood pressure)

Cortisone+DOCA
Heilmeyer C72/54 (heart function *in vitro of damaged heart*)

Cortisone+DOCA+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54 (heart vessels blood pressure)

Adrenaline+Shock (cardiogenic—experimental) in dog
Collier et al C5243/55
(heart vessels)
Adrenaline+Hepatic artery ligature (with portal caval shunt) ↓ in dog
O Brien et al C1644/54 (heart rate)
Adrenaline+Hemorrhage+VDM VEM in rat
Zweifach and Metz C4568/55
(vessel contraction)
Adrenaline (locally)+Hypothermia+Electrical shock (locally) in dog
Brewin B97132/54 (fibrillation)
Adrenaline+Hibernation (artificial) in man
Spitzbarth et al C3723/55
(blood pressure)
Adrenaline+Nerves (emotions) in rat
Crismon and Dryer C2458/55
(vessel contraction)
Adrenaline+ABA (regitine) ↓ in dog
Leimdorfer B96651/53
(heart irregularities)
Adrenaline+*ABA (hexamethonium pendiomid)* ↑ in dog
Pezzuoli and Belli B97996/52
(pulmonary blood pressure)
Adrenaline+*ABA (various)* in man
Bernsmeier and Becker B96468/53
B96469/53 C1443/53
(blood pressure pulse rate)
Adrenaline+ABA (dibenamine) ↓+Glucose in rabbit
Magyar et al C6474/55
(development of arteriosclerosis)
Adrenaline+ABA (chlorpromazine)+Petroleum ether (inhaled) in cat
DiPalma and Catenacci C5247/55
(heart function)
Adrenaline+Anesthetic (locally)
Wiedling B99795/53
(blood pressure)
Adrenaline+Anesthetic (local anesthetic i v) in dog
Frederickson and Morris C5255/55
(heart function)
Adrenaline+Anesthetic (barbiturate i p + local anesthetic i v) in rabbit
Wiedling C766/54 C767/54
(blood pressure)
Adrenaline+Anesthetic (*xylocaine*) ↓ in rabbit
Wiedling *C1067/52 (blood pressure)*
Adrenaline+Aramine in man
Madonia et al C3343/54
(blood pressure heart rate)
Adrenaline+ATP+Potassium in man
Kerschner C1205/54
Adrenaline (locally)+Blood (of diseased patients) in rat
Zweifach and Metz C4568/55
(vessel contraction)

Adrenaline ↑+Digitalis in amphibia
Simon C2710/54
(heart function in vitro)
Adrenaline+Digitalis in dog
O Brien et al *C501/53*
(heart function)
Adrenaline+Flavonoids in rat
Fuhrman C5961/55
(vessel contraction)
Adrenaline+Glucose in rabbit
Magyar et al C6474/55
(development of arteriosclerosis)
Adrenaline+Isonicotinic acid hydrazide Ø in dog
Rubin and Burke B96665/53
(blood pressure)
Adrenaline+Mecholyl in man
Funkenstein and Meade C3733/54
(blood pressure)
Adrenaline+Potassium ↑+*Potassium* deficiency in rat
Zsoter and Szabo B98836/54
(vessel contraction)
Adrenaline+Rauwolfia derivatives in dog
Gourzis et al C3342/54
(blood pressure heart rate)
Adrenaline+Serotonin ↓ in rat
Correale C2711/54 (bleeding time)
Adrenaline+Vitamin B_1 Ø in rat
Fekete and Prokai C3200/54
(heart weight)
Adrenaline+*Starvation in rat*
Crismon and Dryer C2458/55
(vessel contraction)
Adrenaline+Potassium deficiency ↓ in rat
Zsoter and Szabo B98836/54
(vessel contraction)
Noradrenaline in dog
Delaunois and Vandenberghen
C4770/54 (heart function)
Dorner C3203/54 (heart failure blood flow blood pressure)
Ninagawa B99027/54
(blood pressure)
Noradrenaline *(intrathecally)* Ø in man
Liljedahl and von Euler C3474/54
(blood pressure)
Noradrenaline *(to carotid sinus area)* ↓ in dog
Delaunois et al B97975/53
(blood pressure)
Noradrenaline in man
Vellacott C6261/55
(vessel contraction)
Noradrenaline+Cortisone+Potassium deficiency in rat
Rosenman et al C411/54
(blood pressure)
Noradrenaline+DOCA in dog
Vanatta and Cottle C5700/55
(peripheral blood pressure)

DOCA (percutaneously) ↑ in man
Pirtkien and Kuchmeister C1868/54
(capillary blood pressure capillary contraction)

DOCA in rabbit
Binda and Fossenti B93466/53
(vessels)

DOCA Ø in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)

DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53
(heart)

DOCA+Folliculoids+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53
(heart)

DOCA Ø+Folliculoids+Age (immature)+Cholesterol in fowl
Stamler et al B98522/54
(coronary atherogenesis)

DOCA+Thyroidectomy thiourea+Nephrectomy (partial)+NaCl, in rat
Salgado C1002/54
(heart vessels blood pressure)

DOCA+Nephrectomy+NaCl in rat
Page and Glendening C5444/55
(blood pressure vesssels)

DOCA+Nephrectomy (partial)+Renin+NaCl in rat
Masson C5666/54 (heart vessels)
Masson et al C4149/55
(blood pressure)
Page and Glendening C5444/55
(blood pressure vessels)

DOCA+Nephrectomy (partial)+ABA (apresoline)+Reserpine+NaCl in rat
Gaunt et al B97572/54
(blood pressure)

DOCA+Nephrectomy (partial)+Histamine+NaCl in rat
Page and Glendening C5444/55
(blood pressure vessels)

DOCA+Nephrectomy (partial)+Na load in rat
Friedman et al C6616/55
(blood pressure)

DOCA+Nephrectomy (partial)+NaCl in rat
Loustalot C6635/55 (vessels)
Salgado C1002/54
(heart vessels blood pressure)

DOCA+Nephrectomy (partial)+NaCl+Placenta extract thromboplastin in rat
Page and Glendening C5444/55
(blood pressure vessels)

DOCA+Nephrectomy (partial)+NaCl (ad lib.) NaCl (pair fed)+Trimethylglucose in rat
Skelton B97427/54
(heart weight blood pressure)

DOCA+Nephrectomy (partial)+Trimethylglucose Ø+NaCl (pair fed) in rat
Skelton B97427/54 (heart lesions)

DOCA+Renin ↑ in rat
Silva and Crovatto B97552/54
(blood pressure)

DOCA+Age (senile) in rat
Korenchevsky et al C5575/53
(heart)

DOCA+ABA (apresoline Rauwolfia) ↓ +NaCl in rat
Gross C5665/54 (blood pressure)

DOCA+Corn cockle extract ↓+NaCl, in rabbit
Vacek C3544/54 (blood pressure)

(DOCA+NaCl) ↑ in hamster
Stroia et al B99599/54
(blood pressure)

DOCA (long term)+NaCl in rat
Salgado C1002/54
(heart vessels blood pressure)

DOCA+NaCl+Urea in rat
Skelton C5313/55 (heart weight vessels blood pressure)

DOCA+NaCl ↑+NaCl withdrawal in rat
Sturtevant and Hansen C3973/55
(blood pressure)

DOCA+NaCl withdrawal ↓ in rat
Sturtevant and Hansen C3973/55
(blood pressure)

DOCA+*Strophantus* derivatives in rat
Gardner et al B98707/54
(heart weight)

DOCA+Diet starvation in hamster
Knigge C5678/55 (heart weight)

DOCA withdrawal ↓+NaCl in hamster
Stroia et al. B99599/54
(blood pressure)

DCG in frog and rabbit
Loynes and Gowdey B90534/52
(function of hypotonic heart in vitro)

Sex+Folliculoids in fowl
Sturkie and Ringer C2469/55
(blood pressure)

Sex+Trauma in man
Kramar et al B99578/54
(capillary resistance)

Folliculoids in frog
Loynes and Gowdey B90534/52
(function of hypotonic heart in vitro)

Folliculoids (percutaneously) ↓ in man
Pirtkien and Kuchmeister C1868/54
(capillary blood pressure capillary contraction)

Cortisone Ø+Folliculoids+Age (immature)+Cholesterol in fowl
Stamler et al B98522/54
(coronary atherogenesis)
Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55
(heart weight)
Cortisone ↑+Nephrectomy (partial)+ERH (kidney ligature)+Renin+Potassium deficiency in rat
Rosenman et al C441/54
(blood pressure)
Cortisone+Nephrectomy (partial)+Hypertensin in rat
Rosenman et al C441/54
(blood pressure)
Cortisone+Nephrectomy (partial)+Renin+NaCl in rat
Masson C5666/54
(heart–histology heart vessels)
Cortisone Ø+Renin in rat
Rosenman et al C441/54
(blood pressure)
Cortisone ↑+*Renin+Potassium deficiency* in rat
Rosenman et al C441/54
(blood pressure)
Cortisone ↑+Age (immature)+Cholesterol in fowl
Stamler et al B98521/54
(vessel lesion blood pressure)
Cortisone+*Diseases (various)* in man
Catchpole et al C1363/54
(digital blood flow)
Cortisone+Serum in rabbit
Fabre and Berger C191/55
(myocarditis)
Cortisone+Serologic reactions in rabbit
Fabre and Berger C1914/55
(heart inflammation and necrosis)
Cortisone+[ABA (apresoline)+Rauwolfia] ↓ in rat
Gaunt et al B97572/54
(*blood pressure*)
Cortisone+Cholesterol in rabbit
Wang et al C6316/55
(atherosclerosis)
Cortisone+Histamine in rabbit
Williams et al C685 54
(vessel contraction)
Cortisone+Diet in dog
Wilhelmj et al C5978/55
(capillary resistance)
Cortisone+Diet in hamster
Knigge C3678/55 (heart weight)
Cortisone+*Starvation in hamster*
Knigge C3678/55 (heart weight)
Cortisone+Starvation in rat
Bilourdas C5046/55 (capillary *blood flow capillary permeability*
(vessel contraction)

Cortisone ↑+Potassium deficiency in rat
Rosenman et al C441/54
(blood pressure)
Cortisol in dog
Magida and Lubschez C639/54
(ECG)
Cortisol Ø+Folliculoids+Age (immature)+Cholesterol in fowl
Stamler et al B98522/54
(coronary atherogenesis)
Cortisol+Nephrectomy (partial)+Renin+NaCl in rat
Masson C5666/54 (heart vessels)
Cortisol+Nephrectomy (partial)+Na load in rat
Friedman et al C6610/55
(blood pressure)
Cortisol Ø+Age (immature)+Cholesterol in fowl
Stamler et al B98521/54 *(vessels)*
Cortisol+Cholesterol in rabbit
Wang et al C6316/55
(atherosclerosis)
9α chloro ortisol+*DOCA*+Nephrectomy (partial) in rat
Friedman et al C6330/55
(blood pressure heart weight)
9α chlorocortisol+Nephrectomy (partial) in rat
Friedman et al C6330/55
(blood pressure heart weight)
9 chlorocortisol+Nephrectomy (partial) +NaCl in rat
Selye B98967/55 (blood pressure periarteritis nodosa)
9 fluorocortisol in man
Sala et al C4818/55 (ECG)
9 fluorocortisol+Nephrectomy (partial)+*NaCl in rat*
Selye B98967/55 (blood pressure periarteritis nodosa)
Δ cortisone in man
Sala et al C4818/55 (ECG)
DOC in frog
Loynes and Gowdey B90534/52
(function of hypotonic heart in vitro)
DOCA
Thorn et al C3653/55
(blood pressure–discussion)
DOCA in frog
Hoffmann C848/54 (heart function in vitro) C3101 53 (heart contraction in vitro)
Loynes and Gowdey B90534/52
(function of hypotonic heart in vitro)
DOCA in guinea pig
Hoffmann C848 54 (heart function in vitro) C3101/53 (heart contraction in vitro)

Nephrectomy + Renin + NaCl, in rat
Masson et al C5123/55 (vessels)
Nephrectomy + Ureter transplant in vena cava + Peritoneal lavage + Water load, in dog
Kolff et al B97915/54
(vessels blood pressure)
Nephrectomy + Peritoneal lavage in dog
Kolff et al. B97915/54
(vessels blood pressure)
Nephrectomy + Peritoneal lavage + Na ↑ in dog
Kolff et al B97915/54
(blood pressure)
Nephrectomy (partial) + Nephrotomy in dog
D Amico and Saitta C2695/54
(blood pressure)
Nephrectomy (partial) + Nephrectomy (subsequent) + ERH (kidney vessel ligature) in rabbit
Daniel et al C9_0/54
(blood pressure)
Nephrectomy (partial) + ERH (kidney vessel ligature) in dog
Daniel et al. C1061/54
(blood flow in kidney)
Surtshin and Guillermo C1660/54
(blood pressure)
Nephrectomy (partial) + ERH (kidney vessel ligature) in rabbit
Daniel et al C1063/54
(blood pressure blood flow in kidney vessels)
Nephrectomy (partial) + ERH (kidney vessel ligature) ↑ in rat
Braun Menéndez B99_53/53
(blood pressure)
Nephrectomy (partial) + ERH (kidney vessel ligature) + Kidney vessel ligature removal in rabbit
Daniel et al. C1064/54 (blood pressure blood flow in kidney)
Nephrectomy (partial) + ERH (figure of eight ligature) + ABA (various) in dog and rat
Grollman *C5260/55*
(blood pressure)
Nephrectomy (partial) + ERH (figure-of eight ligature) + Na load in rat
Friedman et al C6616/55
(blood pressure)
Nephrectomy (partial) + Kidney vessel ligature + NaCl in rat
Loustalot C6633/55 (vessels)
Nephrectomy (partial) + Renin in rat
Page and Glendening C5444/55
(blood pressure vessels)
Nephrectomy (partial) + Renin (s c) ↑ + NaCl, in rat
Masson et al C4149/55
(blood pressure)
Nephrectomy (partial) + NaCl in rat
Page and Glendening C5444/55
(blood pressure vessels)
Renal corticectomy (partial)
Bing and *Sønder* C874/54
(blood pressure–review)
Renal lesion + Drugs (acidifying) in rat
Lehr and Milora C5268/55
(heart, vessels)
Renal denervation Ø in rabbit
Rosenfeld et al. B98989/54
(blood pressure)
Renal denervation ↓ + Hypertension (cerebral spontaneous) in rabbit
Rosenfeld et al B98989/54
(blood pressure)
Renal denervation (partial) + Hemorrhage + ABA (hexamethonium) + Blood (retransfusion of the shed blood) in dog
Goodyer and Jaeger C24‾3/55
(blood pressure)
Renal insufficiency (experimental) + Dye + Fat in dog
McGill et al. C5920/55
(heart, vessel lesions)
Kidney transplant
Antoine and Ducrot B96831/54
(blood pressure–discussion)
ERH (figure of eight ligature) in hamster
Stroia et al B99399/54
(blood pressure)
ERH (kidney vessel ligature) in rat
Floyer C873/54
(blood pressure–review)
ERH (rubber envelope around kidney) in rat
Loniuc and Goracz C4875/54
(blood pressure)
ERH + Renin antirenin, in dog
Kremen and Wakerlin C5116/55
(blood pressure)
ERH (kidney vessel ligature) + Arteriovenous fistula (femoral) ↓ in dog
Hawthorne et al *C2472/55*
(blood pressure)
ERH (kidney vessel ligature) + ABA (hydergin) in dog
Oyen C51o0/55 (blood pressure)
ERH *(kidney vessel ligature)* + Anesthetic (nembutal) ↓ in rabbit
Rothman C2471/55 (blood pressure)
ERH + Drugs (sulfur-containing) in dog
Schroeder et al. C4175/55
(blood pressure)
ERH (kidney vessel ligature) + Drugs (sulfur containing) mercaptane derivatives in rat
Schroeder et al. C4175/55
(blood pressure)

Folliculoids in rabbit
Loynes and Gowdey B90534/52 (function of hypotonic heart in vitro)
Folliculoids ↑ in rabbit
Richter and Albrich B98329/53 (capillary permeability)
Folliculoids ↓ in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Folliculoids ↓+Testis extirpation in fowl
Sturkie and Ringer C2469/55 (blood pressure)
Folliculoids ↓+Age (immature)+Cholesterol in fowl
Stamler et al B98522/54 (coronary atherogenesis)
Luteoids (discussion)
Colomer C3948/54 (blood pressure vessels)
Luteoids in frog
Loynes and Gowdey B90534/52 (function of hypotonic heart in vitro)
Luteoids (percutaneously) in man
Pirtkien and Kuchmeister C1868/54 (capillary blood pressure capillary contraction)
Luteoids Ø in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Testis extirpation Ø in fowl
Sturkie and Ringer C2469/55 (blood pressure)
Testis extirpation Ø in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Testis extirpation+Aminonitrothiazole ↓ in fowl
Sturkie and Ringer C2469/55 (blood pressure)
Testoids in frog
Loynes and Gowdey B90534/52 (function of hypotonic heart in vitro)
Testoids (percutaneously) ↑ in man
Pirtkien and Kuchmeister C1868/54 (capillary blood pressure capillary contraction)
Testoids in rabbit
Loynes and Gowdey B90534/52 (function of hypotonic heart in vitro)
Testoids Ø in rabbit
Richter and Albrich B98329/53 (capillary permeability)
Testoids Ø in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
MAD in rat
Loustalot C6633/55 (vessels)
MAD+Nephrectomy (partial)+Renin+NaCl in rat
Masson et al C4482/55 (blood pressure heart vessels periarteritis nodosa)
MAD+Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (heart vessels blood pressure)
MAD+NaCl+Urea in rat
Skelton C5313/55 (heart weight vessels blood pressure)
Dehydroisoandrosterone ↑ in man
Rotondo C4437/55 (blood pressure)
Sex (♂) in fowl
Sturkie and Ringer C2469/55 (blood pressure)
Hydroxydione+Anesthetic (ether) in cat
Murphy et al C6030/55 (heart rate blood pressure)
Thyroidectomy Ø in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Thyroidectomy ↓+Nephrectomy (partial)+ERH (figure of eight ligature) in rat
Braun Menendez C4927/54 (blood pressure)
Thyroidectomy+Nephrectomy (partial)+NaCl in rat
Salgado B98385/54 (heart weight)
Salgado C1002/54 (heart, vessels blood pressure)
Thyroidectomy+Renal lesion (experimental)+Prostatectomy in rat
Lehr and Martin C5267/55 (heart vessels)
Martin and Lehr C5274/55 (blood pressure)
Thiourea ↓+Nephrectomy (partial)+ERH (figure of eight ligature) in rat
Braun Menendez C4927/54 (blood pressure)
Thyroxin ↓ in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Thyroxin ↑+Nephrectomy (partial)+ERH (figure of eight ligature) in rat
Braun Menéndez C4927/54 (blood pressure)
Parathyroidectomy ↓+Nephrectomy (partial)+ERH (cellophane wrapping) in rat
Eger B98259/53 (heart weight)
Alloxan+Insulin+Glucose in rabbit
Magyar et al C6474/55 (development of arteriosclerosis)
Pineal extract ↓ in rat
Bergmann C6760/55 (blood pressure)
Nephrectomy+Renin (s c) ↑ in rat
Masson et al. C4149/55 (blood pressure)

Heart vessel ligature (temporary)+Cold+ABA (various) in dog
Rabboni and Giglio C3479/53
(heart function)
Heart vessel ligature (temporary) + Hibernation (artificial) in dog
Rabboni and Giglio C3479/53
(heart function)
Vessel compression (aorta pulmonary artery vena cava) Ø+Hibernation (artificial) in dog
Cahn and Melon B99222/53
(heart function ECG)
Thoracic duct ligature+Serum (bovine) in rabbit
Hayashi and Funaki C6084/55
(granulomata in heart)
Thoracic duct ligature+Azoprotein in rabbit
Hayashi et al C6085/55 (giant cells granulomata in heart)
Hemorrhage in dog
Edwards et al C1025/54
(heart, vessels)
Burns in mouse
Bing and Knudsen C4976/54
(vessel contraction in kidney)
Burns+Dextran, in dog
Dobson and Warner C5078/55
(heart function vessel contraction)
Heat in dog
Chardon and Planc B99141/53
(ECG)
Heat (humid) ↓ in man
Lee B99984/54 (blood pressure)
Heat in rat
van Proosdij Hartzema C3619/54
(blood pressure)
Cold (discussion)
Gregg C34 0/55 (heart function)
Cold in dog
Casolo C2606/54
(*vessel contraction in brain*)
Dubecz et al C2141/54
(pressor reflex)
Imig et al C6311/55
(blood flow in hind leg)
Kleinerman and Hopkins C5307/55
(cerebrovascular resistance blood flow in brain)
Rosomoff and Holaday B99393/54
(cerebral blood flow blood pressure heart rate) C1647/54 (cerebral blood flow blood pressure)
Sabiston et al C1649/54
(heart function blood pressure)
Spurr et al B97923/54 (heart function) B99598/54 (heart rate)
Cold in man
Kuhl et al C5356/55
(heart rate blood pressure)
Cold in mouse
Richards et al B96634/53 (ECG)
Cold ↓ in mouse
Richards et al B96634/53
(heart rate)
Cold in opossum
Nardone et al C6304/55 (ECG)
Cold ↓ in rat
Hansen C3324/54 (blood pressure)
Cold+Anesthetic in dog
Covino and Charleson C1609/54
(ventricular excitability) C6505/55
(ventricular threshold amperage)
Cold+Anesthetic ↓ in rat
Hansen C3324/54 (blood pressure)
Cold (locally)+NaCl ↑ protein ↑ in man
Yoshimura et al B97631/52
(vessel reactivity)
Hypothermia in dog
Brewin B97132/54 (fibrillation)
Covino and Charleson C6505/55
(ventricular threshold amperage)
Siems et al C6503/55 (ECG)
Hibernation (artificial) in dog
Cahn et al C1831/53
(heart function)
Juvenelle et al C2688/54
(blood pressure)
Osborn B966 0/53
(*heart irregularities*)
Lezzuoli et al B98619/54 (blood pressure in lungs blood flow heart function)
Hibernation (artificial) in guinea pig and rabbit
Cahn et al C1831/53
(heart function)
Hibernation in ground squirrel and hedgehog
Dawe and Morrison C1611/54
(heart function ECG)
Ionizing rays in hamster
Fulton and Sudak B99597/54
(*blood flow vessel contraction in cheek pouch* ECG heart function)
Ionizing rays+Hypoxia in rat
Lamson et al C5316/55
(*blood pressure*)
Electroshock in rat
Della Bella C4874/54
(blood pressure)
Ultraviolet light in man
Kramar and Meyers C1637/54
(capillary resistance)
Meyers and Kramar C1643/54
(capillary resistance)
Ultraviolet rays ↑+Dye in rabbit
Partington B97409/52
(capillary permeability)
Ultraviolet rays+Dye+Mepyramine Ø in rabbit
Partington B97409/52
(capillary permeability)

EBH+Vasodilator drugs (various) ↓ in rat
Herr et al B96655/53
(*blood pressure*)
Kidney vessel ligature in dog
Kubicek et al B97916/54
(blood pressure)
Kidney vessel ligature (temporary) in rabbit
Daniel et al C980/54
(blood flow in kidney)
Renin in rabbit
Daniel et al C405/54 (blood pressure blood flow in kidney)
Renin in rat
Crovatto et al B97562/52
(blood pressure)
Lippman and Campbell C5121/55
(blood pressure)
Silva and Crovato B97552/54
(blood pressure)
Renin+Serologic reactions (nephrotoxic globulin) in rat
Lippman and Campbell C5121/55
(blood pressure)
Renin+Anesthetic (barbiturates) in rat
Masson et al C4149/55
(blood pressure)
Renin+Dye in rabbit
Paldino and Hyman C1599/54
(vessel permeability rate of disappearence of dye)
Hypertensin+ABA (hydrazine derivatives) ↓ in rat
Schroeder B98808/54
(blood pressure)
Hypertensin+Dye in rabbit
Paldino and Hyman C1599/54
(vessel permeability rate of disappearance of dye)
Hypertensin+Plasma factor ↑ in rabbit
Helmer C5924/55
(vessel contraction in vitro)
Thymectomy ↑ in dog
Knodgen C2803/52 (blood pressure)
Sary and Porszász C2133/54
(blood pressure)
Thymus extract ↓ in cat, rabbit
Sary and Pórszász C2133/54
(blood pressure)
Thymus extract+Acetylcholine ↓ in cat
Sáry and Pórszasz C2133/54
(blood pressure)
Thymus extract Ø+Scopolamine in cat and rabbit
Sáry and Pórszász C2133/54
(blood pressure)
Splenectomy ↑+Ascorbic acid deficiency in guinea pig
Gabe and Parrot B99783/52
(capillary resistance)
Age (senile) ↓ in man
Zabban C4891/54
(capillary resistance)

Age in rat
Loustalot C6603/55 (vessels)
Aging ↓ in rat
Constantinides and Rutherdale C2644/54 (*mast cells in heart*)
Age Ø+*Trauma* in man
Kramár et al B99578/54
(capillary resistance)
Age (senile) ↓+Muscular exercise in man
Norris et al B98396/53
(*heart rate blood pressure*)

Cardiovascular System ← Stressors

Diseases (various)+Muscular exercise in man
Koster et al C4681/54
(blood pressure pulse rate)
Bacterial toxin in guinea pig
Jones and Carter C5899/54
(heart valves)
Cerebral hypertension (ligation of carotids)+Anesthetic (nembutal) ↓ in rabbit
Rothman C2471/55 (blood pressure)
Hypertension (experimental)+Amines (various) in dog
Ohler and Wakerlin B96653/53
(blood pressure)
Hypertension (experimental)+Anticholinesterase ↓ in dog
Kakushkina and Mentova B97970/53
(blood pressure)
Intracranial compression ↑+*Hypothermia* in dog and fowl
Stone and Rodbard C1658/54
(blood pressure)
Shock ↑ in dog
Miyao B97654/52
(circulation time)
(Trauma in man
Kramár et al B99578/54
(capillary resistance)
Trauma in mouse
Bing and Knudsen C4876/54
(vessel contraction in kidney)
Trauma in rat
Kramar et al B99578/54
(*capillary resistance*)
Ravin et al B96991/54 (ECG)
Trauma+*Serotonin* in rat
Bracco et al C2712/54
(capillary resistance)
Carotid sinus area *constriction* ↑ in dog
Wakerlin et al C1665/54
(blood pressure)
Heart vessel ligature (*temporary*)+ABA (various) in dog
Rabboni and Cigolio C3479/53
(*heart function*)

Heart vessel ligature (temporary) + Cold ↓ + ABA (various) in dog
Rabboni and Giglio C3179/53 (heart function)

Heart vessel ligature (temporary) + Hibernation (artificial) in dog
Rabboni and Giglio C3179/53 (heart function)

Vessel compression (aorta pulmonary artery vena cava) Ø + Hibernation (artificial) in dog
Cahn and Melon B99222/53 (heart function ECG)

Thoracic duct ligature + Serum (bovine) in rabbit
Hayashi and Funaki C6084/55 (granulomata in heart)

Thoracic duct ligature + Azoprotein in rabbit
Hayashi et al C6085/55 (giant cells granulomata in heart)

Hemorrhage in dog
Edwards et al C1025/54 (heart vessels)

Burns in mouse
Bing and Knudsen C4876/54 (vessel contraction in kidney)

Burns + Dextran in dog
Dobson and Warner C5078/55 (heart function vessel contraction)

Heat in dog
Chardon and Plane B99141/53 (ECG)

Heat (humid) ↓ in man
Lee B99984/51 (blood pressure)

Heat in rat
van Proosdij Hartzema C [illegible]619/54 (blood pressure)

Cold (discussion)
Gregg C34[illegible]0/55 (heart function)

Cold in dog
Cavolo C2636/54 (vessel contraction in brain)
Dubecz et al C2141/54 (pressor reflex)
Ling et al C6311/55 (blood flow in hind leg)
Kleinerman and Hopkins C5307/55 (cerebrovascular resistance blood flow in brain)
Rosomoff and Holaday B99395/54 (cerebral blood flow blood pressure heart rate) C1647/54 (cerebral blood flow blood pressure)
Sabiston et al C164[illegible]/54 (heart function blood pressure)
Spurr et al B97923/54 (heart function) B99395/54 (heart rate)

Cold in man
Kuhl et al C5506/55 (heart rate blood pressure)

Cold in mouse
Richards et al B96634/53 (ECG)

Cold ↓ in mouse
Richards et al B96634/53 (heart rate)

Cold in opossum
Nardone et al C6504/55 (ECG)

Cold ↓ in rat
Hansen C3324/54 (blood pressure)

Cold + Anesthetic in dog
Covino and Charleson C1609/54 (ventricular excitability) C6305/55 (ventricular threshold amperage)

Cold + Anesthetic ↓ in rat
Hansen C3324/54 (blood pressure)

Cold (locally) + NaCl ↑ protein ↑ in man
Yoshimura et al B97621/52 (vessel reactivity)

Hypothermia in dog
Brewin B97132/54 (fibrillation)
Covino and Charleson C6505/55 (ventricular threshold amperage)
Siems et al C6[illegible]0[illegible]/55 (ECG)

Hibernation (artificial) in dog
Cahn et al C1831/53 (heart function)
Juvenelle et al C2688/54 (blood pressure)
Osborn B96630/53 (heart irregularities)
Pezzuoli et al B98619/54 (blood pressure in lungs blood flow heart function)

Hibernation (artificial) in guinea pig and rabbit
Cahn et al C1831/53 (heart function)

Hibernation in ground squirrel and hedgehog
Dawe and Morrison C1611/54 (heart function ECG)

Ionizing rays in hamster
Fulton and Sudak B99597/54 (blood flow vessel contraction in cheek pouch, ECG heart function)

Ionizing rays + Hypoxia in rat
Lamson et al C5316/55 (blood pressure)

Electroshock in rat
Della Bella C4874/54 (blood pressure)

Ultraviolet light in man
Kramar and Meyers C1637/54 (capillary resistance)
Meyers and Kramar C1643/54 (capillary resistance)

Ultraviolet rays ↑ + Dye in rabbit
Partington B97409/52 (capillary permeability)

Ultraviolet rays + Dye + *Mepyramine* Ø in rabbit
Partington B97409/52 (capillary permeability)

Nerves (review)
Lachmann C1334/54
(heart function)
Nerves (emotions) ↑ in cat
Schunk C2920/54 (blood pressure)
Nerves (emotions) in dog
Kramar et al B99727/54
(capillary resistance)
Nerves (periost stimulation) in dog
Piana C3232/47
(heart function blood pressure)
Nerves (emotions) in guinea pig
Kramar et al B99727/54
(capillary resistance)
Nerves (emotions) in man
Funkenstein et al C1759/54
(heart function blood pressure)
Kramár et al B99727/54
(capillary resistance)
Treuting C3464/54
(pulse waves plethysmography)
Nerves (psyche) in man
Harris et al B97718/53
(blood pressure)
Nerves (periost stimulation) in rabbit
Piana C3232/47
(heart function blood pressure)
Nerves (stimulation of inflamed periost) in rabbit
Piana C3237/47
(heart function blood pressure)
Nerves (emotions) in rat
Kramar et al B99727/54
(capillary resistance)
Nerves (emotions)+Mecholyl in man
Funkenstein and Meade C3733/54
(blood pressure)
Muscular exercise in guinea pig
Beickert C5571/54 (heart weight)
Muscular exercise in man
Bucht et al B99154/53
(blood flow in kidney)
Koster et al C6212/54
(blood pressure pulse rate)
Muscular exercise+Fasting in man
Henschel et al C1674/54
(pulse rate)
Hypoxia ↑
Hendley and Schiller C1632/54
(capillary permeability)
Hypoxia in cat
Celander B98783/54 (blood flow in muscles skin kidney spleen)
Hypoxia in mouse
Bing and Knudsen C4876/54
(vessel contraction in kidney)
Richards et al B98634/53
(heart rate ECG)
Hypoxia ↑ in rat
van Liere and Fedor C4567/55
(heart weight)
Hypoxia (drowning) in various animals
Gordon et al C4801/54

Hypoxia+ABA (antihistamine dibenzyline) ↓
Hendley and Schiller C1632/54
(capillary permeability)
Hypoxia+ABA (various antihistamine) in rat
Hendley and Schiller C4536/55
(capillary permeability)
Hypoxia ↓+Acetylcholine in dog
Lemaire B99188/53
(blood pressure)
Hypoxia ↑+Histamine in dog
Lemaire B99188/53
(blood pressure)
Serologic reactions in rabbit
Okabayashi and Fujimoto B97657/52 B97658/52 (appearance of rheumatic carditis)
Serum+ABA (antihistamine) in rabbit
Fabre and Berger C1914/55
(myocarditis)
Serum (bovine)+Exudate (pleural) in rabbit
Hayashi et al C6082/55 C6083/55 (granulomata in heart)
Serum (anti-rabbit kidney duck)+Exudate in rabbit
Hayashi et al C6265/53 (heart)
Serum+Phenylbutazone in rabbit
Fabre and Berger C1914/55
(myocarditis)
Serum (horse)+Pyrogen (bacterial) Ø in rabbit
Bennett et al B99815/53
(heart vessels)
ABA (chlorpromazine)↓ in frog
Drapeau and Melville B98871/54
(heart function)
ABA (chlorpromazine) in man
Foster et al B98211/54
(heart rate blood pressure vessel contraction)
ABA (lytic cocktail) in man
Shackman et al B98212/54
(heart function blood pressure)
ABA (atropine)+Acetylcholine+Prostigmine in man
Hoffer B99879/54 (ECG)
ABA (various)+Ammonium salts (intracisternally) in dog
Cicardo and Duprey C4326/54
(blood pressure)
ABA (regitine hydergin) ↓+Cardiazol in dog
Cicardo B98562/54 (blood pressure)
ABA (regitine) ↓+Hemoglobin in rabbit
Schlegel et al B99179/53
(blood pressure)
ABA (hydrazine derivatives)+Pressor drugs (various) in rat
Schroeder B98808/54
(blood pressure)

ABA (hydrazine derivatives) ↑+Serotonin in rat
Schroeder B98808/54 (blood pressure)
ABA (chlorpromazine)+*Strophanthus* derivatives ↑ in frog
Drapeau and Melville B98871/54 (heart function)
Acetylcholine ↓ in dog
Lemaire B99188/53 (blood pressure)
Acetylcholine+Local Anesthetic (i v) in cat
Hirsch et al C3055/54 (blood pressure in Bezold Jarisch reflex)
Anesthetic (procaine) in rabbit
Trnavsky et al. C6478/55 (vessel contraction of ear with nerve supply only)
Anesthetic (barbiturate) ↓ +Cardiazol in frog
Cicardo B98562/54 (blood pressure)
Local anesthetic (i v)+Histamine in cat
Hirsch et al. C3055/54 (blood pressure in Bezold Jarisch reflex)
Anesthetic (barbiturate)+Serotonin ↑ in dog
MacCanon and Horvath B99596/54 (blood pressure)
Local anesthetic (i v)+Veratrin in cat
Hirsch et al C3055/54 (blood pressure in Bezold Jarisch reflex)
Angiodactin (kidney extract)
Fasciolo B97976/53 (blood pressure vessel contraction)
Bile salts ↓ in man
Akagi B97611/52 (systolic blood pressure)
Bile salts ↑ in man
Akagi B97611/52 (diastolic blood pressure)
Blood (*heterologous*) ↓
Wachi B97972/53 B97974/53 (blood pressure)
Blood (heterologous) ↓ in dog
Wachi B97971/53 B97973/53 (blood pressure)
Blood (of *hypertensive patients*) in fowl
Porzio C333/53 (vessel contraction)
Blood (of hypertensive patients) in rabbit
Fishback C4795/50 (*circulation time*)
Carbohydrates ∅+Fasting in dog
Kramár et al B99000/54 (capillary resistance)
Cardiazol ↑ in dog
Cicardo B98562/54 (blood pressure)
Cholesterol+Glucose in rabbit
Magyar et al. C6474/55 (development of arteriosclerosis)
Colloids+Quinine
Masaki et al. C3307/54 (blood pressure)
Corn cockle extract ∅ in rabbit
Vacek C3344/54 (blood pressure)
Dextran ↓ (i p)
Halpern C5664/54 (blood pressure)
Digitalis ↓ in amphibia
Simon C2710/54 (heart function in vitro)
Drugs (SC-4473 SC-3402) in rat
Sturtevant C2757/55 (heart weight)
Egg albumin+Vitamin D in rat
Loustalot C6633/55 (vessels)
Egg white (i p) in rat
Scheiffarth and Berg B99788/53 (heart—histology)
Glucose ↑ in rabbit
Magyar et al C6474/55 (development of arteriosclerosis)
Hemoglobin ↑ in rabbit
Schlegel et al. B99179/53 (*blood pressure*)
Histamine ↓ in dog
Lemaire B99188/53 (blood pressure)
Histamine in guinea pig
Jones and Carter C5899/54 (heart valves)
Histamine ∅ in rat
Constantinides and Rutherdale C2644/54 (mast cells in heart)
Hyaluronidase, in rabbit
Trnavsky et al. C6478/55 (vessel contraction of ear with nerve supply *only*)
Isonicotinic acid hydrazide in man
Michel and Malm C979/54 (blood pressure)
Mucopolysaccharides in guinea pig
Jones and Carter C5899/54 (heart valves)
NaCl *in rat*
Ball et al C2167/54 (blood pressure ECG heart weight)
Polysaccharides in guinea pig
Jones et al C5900/54 (heart valves)
Polyvinylpyrrolidone
Halpern C5664/54 (capillary permeability)
Protein (foreign) in rabbit
Mellors et al. C5918/55 (heart, vessels)
Protein ↓+Fasting in dog
Kramár et al. B99000/54 (capillary resistance)
Salicylate ↑ in man
Bounameaux et al. B99887/54 (bleeding time)

Nerves (review)
Lachmann C1334/54
(heart function)
Nerves (emotions) ↑ in cat
Schunk C2920/54 (blood pressure)
Nerves (emotions) in dog
Kramar et al B99727/54
(capillary resistance)
Nerves (periost stimulation) in dog
Piana C3232/47
(heart function blood pressure)
Nerves (emotions) in guinea pig
Kramar et al B99727/54
(capillary resistance)
Nerves (emotions) in man
Funkenstein et al C1759/54
(heart function blood pressure)
Kramar et al B99727/54
(capillary resistance)
Treuting C3464/54
(pulse waves plethysmography)
Nerves (psyche) in man
Harris et al B97718/53
(blood pressure)
Nerves (periost stimulation) in rabbit
Piana C3232/47
(heart function blood pressure)
Nerves (stimulation of inflamed periost) in rabbit
Piana C3237/47
(heart function blood pressure)
Nerves (emotions) in rat
Kramar et al B99727/54
(capillary resistance)
Nerves (emotions) + Mecholyl in man
Funkenstein and Meade C3733/54
(blood pressure)
Muscular exercise in guinea pig
Beickert C5571/54 (heart weight)
Muscular exercise in man
Bucht et al B99154/53
(blood flow in kidney)
Koster et al C6212/54
(blood pressure pulse rate)
Muscular exercise + Fasting in man
Henschel et al C1674/54
(pulse rate)
Hypoxia ↑
Hendley and Schiller C1632/54
(capillary permeability)
Hypoxia in cat
Celander B98783/54 (blood flow in muscles skin, kidney spleen)
Hypoxia in mouse
Bing and Knudsen C4876/54
(vessel contraction in kidney)
Richards et al B96634/53
(heart rate ECG)
Hypoxia ↑ in rat
van Liere and Fedor C4567/55
(heart weight)
Hypoxia (drowning) in various animals
Gordon et al C4801/54

Hypoxia + ABA (antihistamine dibenzyline) ↓
Hendley and Schiller C1832/54
(capillary permeability)
Hypoxia + ABA (various antihistamine) in rat
Hendley and Schiller C4566/55
(capillary permeability)
Hypoxia ↓ + Acetylcholine in dog
Lemaire B99188/53
(blood pressure)
Hypoxia ↑ + Histamine in dog
Lemaire B99188/53
(blood pressure)
Serologic reactions in rabbit
Okabayashi and Fujimoto
B97657/52 B97658/52 (appearance of rheumatic carditis)
Serum + ABA (antihistamine) in rabbit
Fabre and Berger C1914/55
(myocarditis)
Serum (bovine) + Exudate (pleural) in rabbit
Hayashi et al C6082/55
C6083/55 (granulomata in heart)
Serum (anti-rabbit kidney duck) + Exudate in rabbit
Hayashi et al C6265/53 (heart)
Serum + Phenylbutazone in rabbit
Fabre and Berger C1914/55
(myocarditis)
Serum (horse) + Pyrogen (bacterial) Ø in rabbit
Bennett et al B99815/53
(heart vessels)
ABA (chlorpromazine) ↓ in frog
Drapeau and Melville B98871/54
(heart function)
ABA (chlorpromazine) in man
Foster et al B98211/54
(heart rate blood pressure vessel contraction)
ABA (lytic cocktail) in man
Shackman et al B98212/54
(heart function blood pressure)
ABA (atropine) + Acetylcholine + Prostigmine in man
Hoffer B99879/54 (ECG)
ABA (various) + Ammonium salts *(intracisternally)* in dog
Cicardo and Dutrey C4926/54
(blood pressure)
ABA (regitine hydergin) ↓ + Cardiazol in dog
Cicardo B98562/54 (blood pressure)
ABA (regitine) ↓ + Hemoglobin in rabbit
Schlegel et al B99179/53
(blood pressure)
ABA (hydrazine derivatives) + Pressor drugs (various) in rat
Schroeder B98808/54
(blood pressure)

Mucio et al C6670/55 (C A S)
Porzio C333/53 (vasopressin)
Schunk C2020/54 (C A S)
Thorborg and Gjørup C2922/54 (hormones adrenals)
Wyss C5983/55 (juvenile C A S)

Pathogenesis (kidney)
Deming C6150/54 (unilateral kidney diseases)
Engel and Page C6215/55 (renal compression)
Franksson B97720/53
Freeman et al B99715/54 (kidney vessel occlusion)
Froment and Brun B96832/54
Govaerts C871/54 (RPS)
Grollman C870/54
Klimpel C5883/54 (hypernephroma)
Laforet B96410/53 (unilateral renal artery occlusion)
Mohmer et al B97721/53 (arteriovenous aneurysm in renal pedicle)
Omland C1049/54 (unilateral kidney vessel obstruction)
Tverdy C3821/54 (RPS)
Weiss and Mole B98617/54 (kidney vessel constriction unilateral kidney disease)

Pathogenesis (various)
Arnott B99046/54 (nerves)
Braun Menendez C680/54 (water metabolism Na metabolism)
Delfosse et al B97734/53 (protein metabolism)
Etienne Martin B97716/53 (review)
Floyer C873/54 (extrarenal)
Gross C5665/54 (review)
Hamilton et al C2921/54 (heredity)
Heymans C863/54 (tone and resistance of sino-aortic arterial wall)
Knodgen C2505/52 (thymus)
Laborit C1051/53 (sympathicus)
Ledingham C881/54 (water metabolism Na metabolism)
Maekawa C1048/52 (adenosinetriphosphatase)
Mucio and Andreazzi B96581/54
Oka B97610/52 (heredity)
Oshima B97664/52 (review)
Paton C875/54 (nerves)
Peart C869/54 (secondary sustained hypertension after removal of phaeochromocytoma)
Pereira C864/54 (vessel lesion ⟷ blood pressure)
Sterne B97717/53 (psyche)
Toyama B97665/52 (vascular changes in brain—review)
Winsor B97159/53 (review)
Wyss C5983/55 (psyche)

Hypertension ← Stimuli

Sympathectomy + Na deficiency
Rosenheim C63/54

Hypophysectomy
Luft C6131/54
Luft et al C6210/52
Pertuiset B97511/53 (discussion)

Adrenalectomy
Abbott et al C302/54
D Abreu C2493/55 (discussion)
Anonymous C1567/55 (discussion)
Franksson C2586/53
Hanley C1474/55
Menof C3270/55 (discussion)
Rodriguez Arias and Rodriguez Arias C6660/54 (discussion)
Rosenheim C63/54 (discussion)

Adrenalectomy + Cortisone + DOCA
Franksson C2387/53

Adrenalectomy + Cortisone + ABA (hexamethonium salt)
Green et al C5098/55

Adrenaline + Rauwolfia
Winsor B97573/54

Noradrenaline + ABA (hexamethonium)
Smirk and Doyle C6055/54

Adrenochrome
Rizzente and Troccoli C6151/54

Folliculoids
Gitman and Greenblatt B98400/53

Folliculoids Ø + Sex (♂)
Ramsay et al B99053/54

Pregnancy
Jones B98786/51

Thyroid extract Ø
Bradlow et al B97736/53

Thyroxin
Menof B99704/54

Thymus extract
Knodgen C2803/52

Hypertension ← Stressors

Jaundice
Wiktor and Kedra C4697/54

Cold (discussion)
Itahara et al C5968/55

Hibernation (artificial)
Levy et al B96835/54 (review)

Nerves (emotions)
Itahara et al C5968/55

Muscular exercise
Hood et al B97725/53
Itahara et al C5968/55

Muscular exercise + ABA (hexamethonium)
Ronnov Jessen B97727/53

Drugs
Hoobler and Dontas B97094/53 (various—review)

Serotonin (local to carotid sinus) ↓ in cat
Ginzel and Kottegoda C2717/54
(blood pressure)
Serotonin ↑ in guinea pig
Bracco et al C2712/54 C3976/54
(capillary resistance)
Serotonin ↑ in man
Bracco et al C3976/54
(capillary resistance)
Serotonin (locally) ↓ in man
Bracco et al C2712//54
(bleeding time)
Serotonin ↓ in rat
Correale C2711/54
(blood pressure bleeding time)
Serotonin ↑ in rat
Bracco et al C2712/54 C4976/54
(capillary resistance)
Trypsin ↓ in cat dog
Werle et al B99143/53
(blood pressure)
Trypsin in guinea pig
Jones and Carter C5899/54
(heart valves)
Trypsin ↓ in rabbit
Werle et al B99143/53
(blood pressure)
Urethane in rabbit
Róna C1538/53 (hyalinosis)
Veratrum viride (intracisternal intraventricular intramedullary) in dog
Cicardo B97565/53 (blood pressure)
Diet (protein) Ø in dog
Wilhelmj et al B96734/54
(capillary resistance)
Diet+Fasting in dog and rat
Wilhelmj et al B96734/54
(capillary resistance)
Diet (carbohydrates) Ø+Fasting in dog
Wilhelmj B96734/54
(capillary resistance)
Diet (protein) ↓+Fasting in dog
Wilhelmj B96734/54
(capillary resistance)
Fasting ↑ in dog
Kramar et al B99000/54
(capillary resistance)
Wilhelmj et al B96734/54
C1667/54 (capillary resistance)
Fasting ↑ in rat
Kramar et al B99000/54
(capillary resistance)
Wilhelmj et al C1667/54
(capillary resistance)
Fasting+Refeeding ↓ in rat
Kramar et al B99000/54
(capillary resistance)
Starvation in hamster
Knigge C3678/55 (heart weight)
Ascorbic acid deficiency in guinea pig
Jones and Carter C5899/54
(heart valves)
Ascorbic acid deficiency ↓ in guinea pig
Gabe and Parrot B99783/52
(capillary resistance)
Choline deficiency ↑ in rat
Grollman C1308/54
(blood pressure)
Potassium deficiency Ø in rat
Zsoter and Szabo B98836/54
(blood pressure)
Potassium deficiency ↓ in rat
Freed et al C1081/54
(blood pressure)
Rosenman et al C411/54
(blood pressure)

CARDIOVASCULAR DISEASES

Hypertension

Generalities
Giraud and Latour B98332/54
(review)
Green et al C1050/54 (stages high salt excretion before normal salt excretion)
Grollman C6417/54
Mucio and Andreozzi B96581/54
(review)
Lena B97290/54 (review)
Rosenheim C63/54 (review)
Staub B99080/54 (review)
Various authors C861/54 (review)
Pathogenesis (endocrine G A S hormone treatment)
Bagnall and Robinson B99524/54
(ACTH and/or cortisone)
Balzer B97715/53 (endocrines)
Decourt et al C334/53 (adrenals)
Eger B98259/53
(adrenals hypophysis parathyroid)
Enderle C5596/55 (G-A S)
Graham and Maxwell C66/54
(G A S)
Jimenez Diaz et al C865/54
(noradrenaline secretion from arterial walls)
Laborit C1031/53
(hypophysis–adrenal)
Lemaire et al B99243/54
(pancreatitis)
Litchfield B99931 54
(noradrenaline)
Mader and Iseri C3500/54
(adrenals)
Maggi C4307/54 (adrenals)
Martin and Wilson C951/54
(cortisone)
Masson C5666/54
(corticoids–review)
Menof B99704/54 (hypothyroidism)
C1476/55 (noradrenaline)
C3270/55 (adrenals)
Mucio and Andreozzi B96581/54
(G A S)

Corticoids in urine ← Protein deficiency ↓
de Pava and Valle C2306/54
Ø Aldosterone in urine
Venning et al. C3644/55
VEM in blood
Zweifach and Metz C4568/55
Nerves
Rodriguez Arias and Rodriguez Arias C3438/54 (brain)
EEG
Poidevin C6664/55
Adrenals
Landing C3630/55
(histology of zones)
Ø Adrenals (size of glomerulosa)
Trabucco et al. B97759/52
↑ Adrenals (size of adrenal medulla)
Trabucco et al. B97759/52
Adrenals ← Sympathectomy
Etienne-Martin C879/54
(histology function)
Adrenals ← Renal insufficiency
Trabucco et al. B97759/52
(size of adrenal medulla)
Adrenals ← Renal insufficiency ↑
Trabucco et al. B97759/52
(size of glomerulosa)
Blood count ← ACTH + Rauwolfia alkaloids Ø
Winsor B97573/54 (eosinophils)
Thymus (*function histology*) in dog
Knodgen C2803/52
Capillary resistance ← ABA (*hexamethonium*)
Eurman and Mendlowitz B6152/54
Capillary resistance ← Na deficiency
Eurman and Mendlowitz B6152/54
Blood pressure ← Adrenalectomy + Cortisone
Thorn et al. C3653/55
Blood pressure ← Adrenalectomy + DOCA ↑ Cpd. B ↑
Thorn et al. C3653/55
Blood pressure ← Cl Ø Na Ø + NaCl deficiency
Martini and Kaiser C882/54
Blood pressure ← NaCl ↑ + NaCl deficiency
Martini and Kaiser C882/54
Blood pressure ← Na deficiency ↓
Genest C878/54
Martini and Kaiser C882/54
Heart function ← DOCA + Digitoxin
Brandes and Suchowsky B99924/54
Vessels in adrenals
Balo C2145/54
Kidney ← Hypertensin
Dustan et al. C4052/55 (function)
Skin (urticaria edematous reactions) ← Dextran
Moeller C4001/55
(renal hypertension)
↓ Tumor (incidence)
Zondek and Tchetchik B96696/53

Other Cardiovascular Diseases

Angiitis (hypersensitivity) ← ACTH
Edge et al. C6251/55
Angiitis (hypersensitivity) → Adrenal (histology)
Edge et al. C6251/55
Angina pectoris → 17 hydroxycorticoids in blood ← Age
Engel et al. C1913/55
Angina pectoris → Eosinophils in blood ← Age
Engel et al. C1913/55
Aneurysm (abdominal) → F Cs 17 KS in urine
Langeron et al. C5602/54
Apoplectic insult—Pathogenesis (emotion)
Anonymous B97140/54
Arterial insufficiency → Muscular contraction ← Cortisone ↑ + Digitalis
Mendez C637/54
Arteriolitis (necrotizing)—Pathogenesis (hypophysis—adrenals)
Rothermich and von Haam B99758/53
Arteriopathy (chronic peripheral) ← Noradrenaline
Tagliaferro and Carrantino B96470/53
Arteriosclerosis ← Adrenalectomy Ø + Sympathectomy
Fontaine et al. B97740/53
Arteritis—Pathogenesis (G-A S)
Borgetti and Rovati C623/52
Arteritis ← ACTH and/or cortisone
Ask Upmark B99522/54 (brachiocephalic)
Jennings B96438/53 (temporal)
Morin et al. B96464/53 (temporal)
Oosthuizen and Wyk B99520/54 (temporal)
van der Sar B96465/53 (disseminated)
Schaerstrom B96463/53 (temporal)
de Seze and Denis B96462/53 (temporal)
Arteritis → Hyaluronidase inhibitor in blood
Borghetti and Rovati C623/52
Arteritis obliterans—Pathogenesis (sympathicus)
Laborit C1051/53
Ascites—Pathogenesis (adrenal)
Halmagyi et al. C6480/55
Asthma cardiale—Pathogenesis (liquorice)
Hennemann B98164/54
Atrioventricular block (rheumatic) ← ACTH
Escalier et al. B96772/52
Buerger s disease → 17 KS in urine ← Sympathectomy
Loreto and Scala C_953/53

ABA
- Allen et al B97482/54 (various)
- Eiber C6264/55 (chlorpromazine+rauwolfia)
- Schroeder et al B98807/54 (hexamethonium derivatives+apresoline)
- Schumann B97723/53 (nepresol)
- Stevenson and Sjoerdsma B98158/54 (chlorpromazine)
- Taylor et al B96351/54 (apresoline)

ABA (veriloid)+Angiotonin
- Black and Doyle C6036/53

ABA (hexamethonium)+Angiotonin
- Smirk and Doyle C6035/54

ABA (apresoline)+Na deficiency
- Gill et al B97730/53

ABA (various)+NaCl deficiency
- Grob and Langford B97724/53

Anesthetic
- Ehrlich et al B97737/53
- Levy and Sapir B97738/53 (discussion)

Anturenin
- Staub B97731/54 (discussion)

Cation exchange resin
- Schipke and Schlag C2925/54

Fluid intake (*sake*)
- Itahara et al C5968/55

Heparin
- Sarre C744/54 (discussion)
- *Sartorius et al C2926/54*

NaCl
- Itahara et al C5968/55

NaCl substitutes (review)
- von *Skramlik B98917/52*

Nepresol
- Putz and Posthofen B97240/54

Rauwolfia alkaloids
- *Various authors B97571/54* (review)

Diet
- Gounelle B97735/53 (discussion)
- Staub B99080/54 (discussion)
- Vivanco and Barreda B97733/53

Na deficiency
- Anonymous C1035/54 (discussion)
- *Gill and Duncan B97739/53* (sympathectomy failure)
- Rosenheim C63/54 (discussion)

NaCl deficiency
- Chytil et al B97732/53

Climate
- Itahara et al C5968/55

Season
- *Itahara et al* C5968/55

Hypertension → Targets

Body weight ← NaCl withdrawal
- Renwick et al C6775/55

↑ Water (extracellular fluid volume)
- Teng et al B97586/54

Water in tissues ← NaCl deficiency
- Mucio et al C3159/54

Nitrogen in urine ← NaCl withdrawal
- Renwick et al. C6775/55

Na in urine ← Adrenalectomy+Cortisone
- Green et al C5098/55

Na in urine ← Folliculoids Ø+Sex (♂)
- Ramsay et al B99053/54

Na in urine ← Hypertensin
- Dustan et al C4052/55

NaCl ← Nerves (emotion) ↑
- Miles and de Wardener B97757/53 (in urine)

NaCl ← Rauwolfia alkaloids Ø
- Winsor B97573/54 (in blood)

NaCl ← NaCl withdrawal
- Renwick et al C6775/55 (in urine)

NaCl ← NaCl deficiency
- *Dahl et al C2855/55* (on skin balance)
- *Mucio et al C3159/54* (in tissues balance)

↓ Potassium in blood
- Caron B97960/53 (of adrenal origin—discussion)

Potassium in urine
- *Wyngaarden et al C3070/54*

Potassium in urine ← NaCl withdrawal
- *Renwick et al C6775/55*

Potassium (on skin balance) ← *NaCl deficiency*
- Dahl et al C2855/55

Diuresis ← Nerves (emotion) ↑
- Miles and de Wardener B97757 53

Diuresis ← Hypertensin
- Dustan et al C4052/55

Diuresis ← NaCl withdrawal
- Renwick et al C6775/55

ACTH in urine
- Mucio et al C6670/55

Vasopressin in body fluids
- Scavo C4930/54 (discussion)

Vasopressin (*vasoconstrictor substance*) in blood
- Schroeder and Perry *C5150/55*

Adrenaline in adrenals
- von Euler et al C2075/54

Noradrenaline in adrenals
- von Euler et al C2075/54

Noradrenaline in urine
- von Euler B97015/52
- West C4904/54

Noradrenaline in urine ← Adrenalectomy
- von Euler C877/54

Ø Corticoids in urine (reducing)
- de Paiva and Valle C2306/54

Corticoids in urine ← Protein ↑
- de Paiva and Valle C2306/54

Corticoids in urine ← Na deficiency Ø
- *Genest C878/54*

Hypotension → 17 KS in urine
  Piotti C1855/53 C1858/53
Hypotension → Blood count
  Castaldi and Fedeli C350/54
  (eosinophils)
Hypotension → Blood count ← ACTH
  Piotti C1855/53 C1856/53
  (eosinophils)
Hypotension → Blood count ← Adrenaline
  Piotti C1856/53 (eosinophils)
Hypotension → Blood count ← Short waves
  Piotti C1855/53 (*eosinophils*)
Hypotension → Blood count ← Fasting
  Piotti C1855/53 (eosinophils)
  Piotti and Bonomi C127/53
  (eosinophils)
Ischemic heart disease—Pathogenesis
  (nerves)
  Arnott B99046/54
Myocardial infarction—Pathogenesis
  Arienzo C3889/54
  (trauma psyche)
  de Matteis and Re C3888/54
  (trauma)
Myocardial *infarction* ← *Noradrenaline*
  Baird C3893/53
  Sampson and Zipser C5692/54
Myocardial infarction ← Hibernation
  (artificial)
  Decortis C3887/54
Mycardial infarction ↑ → Temperature
  Feldthusen and Lassen B99495/54
Myocardial infarction → Temperature
  ← Sex
  Forssman C252/54
Myocardial infarction → Glucose in blood
  ← Sex
  Forssman C252/54
Myocardial infarction → Hexosamine
  in blood
  Boas et al C5708/55
Myocardial infarction → Na in blood
  Tartara and Casirola C1214/54
Myocardial infarction ↑ → Potassium
  in blood
  Tartara and Casirola C1214/54
Myocardial *infarction* → *Calcium in* blood
  Tartara and Casirola C1214/54
Myocardial *infarction* ↓ → *Iron in blood*
  Feldthusen and Lassen B99495/54
Myocardial infarction ↑ → Iron in blood
  Erlsbacher and Popp C1215/53
Myocardial infarction Ø → Adrenaline
  in urine
  Forssman C252/54
Myocardial infarction ↑ → Noradrenaline
  in urine ← Sex
  Forssman C252/54
Myocardial infarction ↑ → Corticoids
  in urine ← Sex
  Forssman C252/54 (chemical)

Myocardial infarction → 17 hydroxycorti*coids in blood* ← Age
  Engel et al C1913/55
Myocardial *infarction* ↑ → 17 KS
  in urine ← Sex
  Forssman C252/54
Myocardial infarction ↓ → Cholinesterase
  in blood
  Oka C6201/54
Myocardial infarction → Pain ← ABA
  (chlorpromazine) ↓
  Roisin and di Borgo C3891/54
Myocardial infarction ↓ → Eosinophils
  in blood
  Feldthusen and Lassen B99495/54
  Forssman C252/54
Myocardial infarction → *Eosinophils*
  in blood ← Sex (♀) ↓
  Forssman C252/54
Myocardial infarction → Eosinophils
  in blood ← Age
  Engel et al C1913/55
Myocardial infarction ↑ → Leucocytes
  in blood ← Sex
  Forssman C252/54
Myocardial infarction → Blood coagulation
  (phases)
  Beaumont et al C13/53
Myocardial necrosis ↑ → Glutamic
  oxaloacetic transaminase in blood
  Steinberg and Ostrow C5971/55
Obliterating arteriopathy (*juvenile*
  chronic) ← Hibernation
  (artificial)
  Nicolosi B96467/53
Obstruction of the superior vena cava ←
  ACTH
  Klein B96473/53
Periarteritis nodosa
  Anonymous B98575/54 (review)
Periarteritis nodosa—Pathogenesis
  Giard and Verstraete C2928/54
  (*G A S*)
  Kobernick B89145/54 (G-A S)
  Lyall B99701/54 (*G-A S* +
  pressure in arteries)
Periarteritis nodosa ← ACTH and/or
  cortisone
  Arbesman and Richard B99511/54
  Asboe Hansen C833/54
  (discussion)
  Baehr and Levitt B97171/54
  (review)
  Benhamou et al C2929/54
  Caldwell C6429/55
  (polymyositic—discussion)
  Giard and Verstraete C2928/54
  (discussion)
  Lechelle and Delaporte B96461/53
  Lincoln and Ricker C671/54
  (with L E cells)
  Michon et al C4291/54
  (anodular idiophatic polyangiitis)

Buerger s disease → Eosinophils in blood ← ACTH
Marmaccio and Buonsanto C4533/53
Carditis ← ACTH and/or cortisone
Bar Hai and Mundel C4758/54
Diedenhofen C652/54 (rheumatic)
Hochrein C982/52 (rheumatic–discussion)
Konrad C5772/54 (rheumatic)
Massell B99539/54 B99540/54 B99541/54 (rheumatic)
Rottini and Grego C1851/54 (rheumatic)
Taran et al B97848/54 (rheumatic)
Carditis ← ACTH withdrawal
Greenstein B97847/54 (rheumatic)
Carditis ← ACTH + Cortisol
Grubb and Hines B99885/54 (rheumatic)
Carditis ← 9α fluorocortisol
Ballabio et al C4816/55 (rheumatic)
Carditis ← Δ cortisone
Ballabio et al C4816/55 (rheumatic)
Dordick and Gluck C4779/55 (rheumatic)
Carditis ← Cafestrol
Cloetens C6149/54 (rheumatic)
Carditis → Ascorbic acid in blood
Prytz and Zeftel B99542/54 (rheumatic)
Carditis → Tyrosyl derivatives in urine ← Cortisone Ø
Prytz and Zeftel B99542/54 (rheumatic)
Congenital heart disease Ø → Adrenals (histology)
Lanman C116/53
Coronary diseases–Pathogenesis
Enos et al C6490/55 (topical stress in vessels)
Green Armytage C6425/55 (ovary)
Stewart C70/54 (G A S)
Coronary disease ← Folliculoids
Gitman and Greenblatt B98400/53
Coronary thrombosis–Pathogenesis (ACTH treatment)
Brodthagen C3850/54
Coronary thrombosis (acute) ↑ → Noradrenaline in urine
von Euler B97015/52
Endarteritis ← Noradrenaline derivatives
Ramorino B97741/53
Endarteritis of thoracic aorta ← Cortisone
Hueber et al C5724/54
Endoangiitis (visceral)–Pathogenesis (adrenal)
Meyer C-417/54
Endocarditis–Pathogenesis
Phillips et al C35-6/55 (cortisone)
Fratsicas and Cassimatis C358/53 (DOCA)
Endocarditis ← Cortisone (discussion)
Deguillaume C6148/54

Flutter fibrillation–Pathogenesis (psyche)
Kuzminska B99238/53
Heart failure–Pathogenesis
Moritz B99944/54 (G A S)
Raab C234/54 (adrenals)
Wold C4014/54 (ACTH and/or cortisone)
Heart failure ← ACTH
Jackson and Slavin B97870/54 (amyloidosis)
Heart failure ← Na deficiency
Anonymous C1035/54 (discussion)
Heart failure ← NaCl deficiency
Zera B96773/53
Heart failure → NaCl potassium in saliva
White et al C1940/55
Heart failure (congestive) → Aldosterone in urine
Axelrad et al C6372/55
Heart failure ↑ → Aldosterone in urine
Luetscher and Johnson B99409/54
Heart failure → 17 KS in urine ← Drugs (mercurial diuretic) Ø
Vallecorsi and Checchia C2941/53
Heart failure → Ascorbic acid in blood urine ← Starvation
Benedetti and Picone C4690/54
Heart failure ↑ → Pyruvic acid in blood
Citelli B99497/54
Hypotension–Pathogenesis (adrenals)
Black and Harken B98540/54 (postoperative)
Bochu C3909/54 (hepatic disease)
Piotti C1855/53 C1856/53
Hypotension ← Vasopressin
Swartz B97713/53
Hypotension ← Medulloids
Checchi B97714/53
Hypotension ← Noradrenaline
Barlow et al C331/53 (acute)
Hypotension ← DOCA
Swartz B97713/53
Hypotension → Glucose in blood ← Adrenaline insulin
Piotti C1855 53
Hypotension ↓ → Albumin in blood
Malamani et al B97712/53 (constitutional)
Hypotension ↑ → Globulin in blood
Malamani et al B97712/53 (constitutional)
Hypotension ↓ → Protein in blood
Malamani et al B97712/53 (constitutional)
Hypotension → Diuresis ← Water load
Piotti C1856/53
Hypotension → Corticoids in urine
Piotti C1856/53
Hypotension → Corticoids in urine ← ACTH
Piotti C1855/53
Hypotension → Corticoids in urine ← Fasting
Piotti and Bonomi C127/53

Hypophysectomy+LAP+ACTH+DOCA+
Nephrectomy (partial)+NaCl
in rat
Salgado B99121/54 C1002/54
(weight, histology)
Hypophysectomy+ACTH+STH+
Nephrectomy (*partial*)+NaCl
in rat
Salgado C1002/54
(weight, histology)
Hypophysectomy+STH in dog
Altszuler et al. C5042/55 (function)
White C4240/55 (function)
Hypophysectomy+STH+LTH+
Ovariectomy+Folliculoids+
Luteoids in rat
Souders C5152/55 (weight)
Hypophysectomy+STH+DOCA+
Thyroxin+Nephrectomy (partial)+
NaCl in rat
Salgado B99121/54 C1002/54
(weight histology)
Hypophysectomy+STH+Folic acid,
vitamin B_1 in rat
Penhos and Foglia C6746/54
(weight)
Hypophysectomy+Cortisone ↑ in rat
Greenberg and Aterman B99025/54
(weight/body weight)
Hypophysectomy+Cortisone+DOCA+
Nephrectomy (partial)+NaCl
in rat
Salgado C1002/54
(weight histology)
Hypophysectomy+DOCA+Thyroxin+
Nephrectomy (partial)+NaCl,
in rat
Salgado C1002/54
(weight, histology)
Hypophysectomy+DOCA+Nephrectomy
(partial)+NaCl, in rat
Salgado B99121/54
(weight histology)
Hypophysectomy+Alloxan in rabbit
Nagahama B96563/53
(histological changes)
Hypophysectomy+Nephrectomy (*partial*)+
+ERH (kidney wrapping) in rat
Eger and Gothe B99215/54
(nuclear size)
Hypophysectomy+Nephrectomy (partial)+
Renin Ø in rat
Schaffenburg et al C443/54
(weight)
Hypophysectomy+Drugs (SC-4473
SC-3402) *in rat*
Sturtevant C2757/55 (weight)
Hypophysectomy+Croton oil (to hepatic
hilus) in dog
Bernard et al. C5482/53
(histology)
Hypophysectomy+NaCl in dog
Simmons et al C6509/55
(function)
ACTH
Pacovsky C484/53 (desquamated
epithelial cells in urinary deposit
as indicator of protein absorption in
the renal tubule)
ACTH in dog
Soffer C6132/54 (function)
ACTH ↑ in salamander
Bragdon and Dent C4[illegible]9/54
(fat in renal tubules)
ACTH+STH+Nephrectomy (partial)+
NaCl in rat
Salgado C1002/54
(weight, histology)
ACTH+Cortisone in man
Hume et al. C4198/55
(kidney homotransplant)
ACTH+DOCA+Nephrectomy (partial)+
NaCl, *in rat*
Page and Glendening C5444/55
(function histology)
ACTH Ø+Pregnancy in monkey
Schmidt and Hoffmann B96565/54
ACTH (to mother) Ø+Pregnancy+Age
(foetal) in monkey
Schmidt and Hoffmann B96565/54
ACTH ↓+Antikidney serum in rat
Lamperi and Cheli B97934/54
(histological lesions)
ACTH+Casein+Potassium chloride+
Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
ACTH+NaCl+Potassium in dog
Giebisch and MacLeod C5093/55
(function)
ACTH+Potassium chloride+Protein
deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
STH in dog
White C4240/55 (function)
STH ↑ *in dog*
Campbell B99964/53
(weight/body weight)
STH Ø in guinea pig
Lanzza et al *B99567/53*
(histology)
STH in rat
Selye and Bois C5466/55 (weight)
STH+Adrenalectomy+Cortisol+DOCA
in rat
Selye and Bois C5466/55 (weight)
STH+*Thyroidectomy+Nephrectomy*
(partial)+NaCl in rat
Salgado B98385/54 C1002/54
(weight, histology)
STH ↑+Testis extirpation, in rat
Sforzini C86/53 C3218/53 (weight)

Roskam C1965/53
Shedrow B96459/53
Sperling B97883/54 (discussion)
Symmers B96439/53 (autopsy)
Vieira et al C5723/54
Periarteritis nodosa ← Cortisol
Arbesman and Richard B99511/54
Periarteritis nodosa ← Rheumatoid arthritis
Ball C1359/54
Periarteritis nodosa → Corticoids 17 KS in urine
Roskam C1965/53
Periarteritis nodosa → Hypophysis (alpha cells) ← ACTH ↑
Symmers B96439/53
Periarteritis nodosa → Adrenals (histology)
Thiers et al B96460/53
Periarteritis nodosa → Adrenals (weight) ← ACTH ↑
Symmers B96439/53
Periarteritis nodosa → Thyroid (function) ← ACTH ↑
Symmers B96439/53
Periarteritis nodosa → Eosinophils ← ACTH
Lechelle and Delaporte B96461/53
Periarteritis nodosa → Kidney (histology function)
Darmady et al. C2491/55
Periarteritis nodosa → Kidney (function) ← Vasopressin
Darmady et al C2491/55
Pericarditis (uraemic) ← Cortisone
Hunter and Read C2951/54
Phlebitis–Pathogenesis (cortisone)
Coste and Laurent B98537/54
Phlebodynia ← ACTH and/or cortisone
Pearson B98392/53
Thromboangiitis ← Adrenalectomy + Sympathectomy
Fontaine et al B97740/53
Thromboangiitis → Nerves (pain) ← Adrenalectomy (partial) ↓
Leriche B96643/53 (discussion)
Thromboangiitis → Adrenals (histology)
Ledru and Cautier C2932/54
Thrombophlebitis–Pathogenesis (G A S)
Laborit C1051/53
Thrombophlebitis ← Trypsin
Fisher and Wilensky C5590/54
Innerfield C5650/54 B99714/54
Seligman C5589/55
Various cardiovascular diseases (diabetic) ← Hypophysectomy + Cortisone + Insulin
Kinsell et al C952/54
Various cardiovascular diseases (diabetic) ← Adrenalectomy + G Cs + Insulin
Wortham and Headstream C953/54
Various cardiovascular diseases ← Corticoids (discussion)
Schumann B99496/52
Various cardiovascular diseases ← Cortisone + Digitalis
Pichler C1217/54
Various cardiovascular diseases → Na in urine ← Muscular exercise
Freeman et al C6780/55
Various cardiovascular diseases → Diuresis ← Muscular exercise
Freeman et al C6780/55
Various cardiovascular diseases → Vasopressin in body fluids
Scavo C4930/54 (discussion)
Various cardiovascular diseases → Adrenaline noradrenaline in heart
Raab and Gigee C4917/55
Various cardiovascular diseases → 17 hydrocorticoids eosinophils in blood ← Starvation
Weston et al C5167/55
Various cardiovascular diseases → Arterial constriction ← Adrenal demedullation ↑
Norwicki C2930/54
Various cardiovascular diseases → Kidney (function) ← Muscular exercise
Freeman et al. C6780/55
Various vessel diseases–Diagnosis (cutaneous test with sex hormones)
Judmaier B98391/53
Vasolability → Blood count ← Muscular exercise
Koster et al C4681/54
(leucocytes eosinophils)

KIDNEY

(Including the urinary tract)

(For earlier pertinent data cf also *Stress* pp 603 641 AROS 1951 pp 351 371 AROS 1952 pp 233 237 AROS 1953 pp 303 311 AROS 1954 pp 464-470)

Generalities
Drury C3431/55
(review on kidney function)
Lévy and Barjon C4833/54
(kidney and endocrines–review)

Kidney ← Stimuli

Sympathicus stimulation in dog
Blake and Straumfjord C4017/55
(function)
Buffer nerve section + Renin, in dog
Corcoran and del Greco C5070/55
(function)
Hypothalamus stimulation in guinea pig
Chevreau et al C3113/53
(histology)
Hypophysectomy ↓ in rat
Eger and Gothe B99215/54
(nuclear size)

Adrenalectomy + Cortisone withdrawal ↓ in man
Randall B96556/54 (function—discussion)

Adrenalectomy + Cortisol ↑ in dog
Liddle et al B97940/54 (glomerular filtration rate)

Adrenalectomy + Cortisol + DOCA in rat
Selye and Bois C5466/55 (weight)

Adrenalectomy + Cortisol + DOCA + Diet in rat
Ventura C5857/55 (weight)

Adrenalectomy + Cortisol + DOCA + Starvation in rat
Ventura and Selye C1531/55 (weight)

Adrenalectomy + Cortisol + MAD + Nephrectomy (partial) + NaCl, in rat
Salgado C1002/54 (weight histology)

Adrenalectomy + M C (urine extract= aldosterone?) Ø in rat
Sala and Luetscher B98718/54 (creatinine clearance)

Adrenalectomy + DOC + Hemorrhage + Blood (reinfused) + NaCl in dog
Watson et al C5701/55 (function)

Adrenalectomy + DOCA in dog
Garrod et al C5707/55 (function)

Adrenalectomy + DOCA in rat
Gross et al B99957/55 (histology)
Sala and Luetscher B98718/54 (creatinine clearance)
Scheiffarth and Berg B99788/53 (histology)
Selye and Bois C5466/55 (weight)

Adrenalectomy + DOCA + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight histology)

Adrenalectomy + DOCA + Nephrectomy (partial) + Ascorbic acid Ø in rat
Bergeron et al C4660/54 (weight)

Adrenalectomy + DOCA Ø + Nephrectomy (partial) + NaCl in rat
Gross et al B99957/55 (histology)

Adrenalectomy + DOCA + Trauma in rat
Jancso C4547/55 (function histology)

Adrenalectomy + DOCA + Serum in rat
Scheiffarth and Berg B99788/53 (histology)

Adrenalectomy + DOCA + ABA (antihistamine) + Histamine in rat
Jancso C4547/55 (function histology)

Adrenalectomy + DOCA + Histamine in rat
Jancso C4547/55 (function histology)

Adrenalectomy + DOCA + Diet in rat
Ventura C5857/55 (weight)

Adrenalectomy + Aldosterone Ø in rat
Sala and Luetscher B98718/54 (creatinine clearance)

Adrenalectomy + Cpd B Ø in rat
Fruhman and Gordon C1902/55 (weight)

Adrenalectomy + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight histology)

Adrenalectomy + Alloxan in rabbit
Nagahama B96563/53 (histology)

Adrenalectomy + Serum in rat
Scheiffarth and Berg B99788/53 (histology)

Adrenal transplant in rabbit
Bindi and Fossenti B93466/53 (histology)

Adrenaline in dog
Blake C6312/55 (function)
Blake and Straumfjord C4047/55 (function)
Handley and Moyer C2662/55 (function)
Malmendier and Kenis B96831/54 (creatinine and inulin clearance)

Adrenaline in man
King and Baldwin C4063/55 (function blood flow)
Mills et al C509/53 (function)

Adrenaline in rabbit
Chait et al B99482/54 (function)

Adrenaline + DOCA in rat
Page and Glendening C5444/55 (function histology)

Adrenaline + Kidney denervation, in dog
Blake C6312/55 (function)
Santenoise et al C1091/49 (volume)

Adrenaline + Vitamin B_1 in rat
Fekete and Prokai C5200/54 (weight)

Adrenaline + Water load dehydration in dog
Blake C6312/55 (function)

Noradrenaline in dog
Blake and Straumfjord C4047/55 (function)
Handley and Moyer B97927/54 C2662/55 (function)
Moyer et al C3192/54 (function)

Noradrenaline in man
Handley and Moyer B97927/54 (function)
King and Baldwin C4063/55 (function blood flow)

STH + Testis extirpation + Testoids ↑ in rat
Sforzini C3218/53 (weight)
STH + Testoids + Choline deficiency in rat
Wilgram et al C5169/55 (histology)
STH + MAD + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 (weight histology)
STH + Alloxan in rat
Malandra et al C3085/53 (weight)
STH + Nephrectomy (partial) + NaCl in rat
Salgado B98385/54 (weight lesions)
STH + *Monilia* in rat
Cavallero C829/54 (infectious foci)
STH Ø + Ionizing rays in rat
Sellers and Barlow B98893/54 (weight/body weight)
STH ↑ + Antikidney serum in rat
Lamperi and Cheli B97934/54 (histological lesion)
STH + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54 C1991/53 (weight)
STH + Protein deficiency in rat
Aschkenasy and Dray B99606/54 (weight)
GTH (anti GTH production) in rat
Bajusz C6759/55 (allergic glomerulonephritis)
TTH + Thyroidectomy + Nephrectomy (partial) + NaCl in rat
Salgado B98385/54 (weight) C1002/54 (weight histology)
TTH + Nephrectomy (partial) + NaCl in rat
Salgado B98385/54 (weight kidney lesion) C1002/54 (weight histology)
Hypophyseal posterior lobe extirpation ↓ in dog
Demunbrun et al C1587/54 (function)
Hypophyseal posterior lobe extirpation + Hypophyseal posterior lobe extract ↑ vasopressin Ø oxytocin ↑ in dog
Demunbrun et al C1587/54 (function)
Hypophyseal posterior lobe extirpation + Adrenaline noradrenaline in dog
Williams and Clarke C1668/54 (function)
Hypophyseal posterior lobe extract + Dye in frog
Jancso C4547/55 (function histology dye)
Vasopressin + Adrenalectomy in rat
Still and Whitcomb B98990/54 (shunt mechanisms)
Vasopressin + Noradrenaline in man
Nickel et al C458/54 (function)
Vasopressin + DOCA + Nephrectomy (partial) + NaCl in rat
Page and Glendening C5444/55 (function histology)
Vasopressin + Age (senile) ↓ + Water load in man
Miller and Shock B98337/53 (function)
Vasopressin + Dye in rat
Still C235/52 (glomerular intermittence)
Vasopressin + Pyrogen + Water load in dog
Brandt et al C3673/55 (function)
Pituitary dwarfism + Sex + Nephrectomy (partial) in mouse
Crepax B95898/54 (weight)
Adrenalectomy ↓ in rat
Sala and Luetscher B95718/54 (creatinine clearance)
Adrenalectomy + Adrenaline in dog
Williams and Clarke C1668/54 (function)
Adrenalectomy + Adrenaline in rat
Still and Whitcomb B98990/54 (shunt mechanisms)
Adrenalectomy + Adrenaline + Cortisone + DOCA + Histamine in rat
Jancso C4547/55 (function histology)
Adrenalectomy + Adrenaline + DOCA + Histamine in rat
Jancsó C4547/55 (function histology)
Adrenalectomy + Adrenaline + Splenectomy + Water deficiency in dog
Blake C6312/55 (function)
Adrenalectomy + Noradrenaline in dog
Williams and Clarke C1668/54 (function)
Adrenalectomy + Noradrenaline in man
Nickel et al C458/54 (function)
Adrenalectomy + Cortisone in dog
Garrod et al C5707/55 (function) Liddle et al B97940/54 (glomerular filtration rate)
Adrenalectomy + Cortisone in rat
Fraile C4666/53 (weight) Sala and Luetscher B98718/54 (creatinine clearance)
Adrenalectomy + Cortisone + Testis extirpation in rat
Tremolieres et al C1924/54 (weight)
Adrenalectomy + Cortisone ↑ + *Monilia* in rat
Cavallero C829/54 (infectious foci)

Mills et al C509/53 (function)
Moeller and Gulke C2948/54 (function)
Noradrenaline ↑+Hemorrhage in dog
Moyer et al C3192/54 (function)
Noradrenaline+Anesthesia (spinal) in man
Nickel et al C458/54 (function)
Adrenaline derivatives in man
Nickel et al C458/54 (function)
Cortisone
Pacovsky C464/53 (desquamated epithelial cells in urinary deposit as indicator of protein absorption in the renal tubule)
Cortisone in dog
Dempster B98319/53 (homotransplant)
Lambert and Gregoire C3379/54 (function)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone in rabbit
Bracali and Spigoloni C11/54 (histology)
Businco B99102/54 (histology)
Róna C1538/53 (*nephrosclerosis*)
Rosen et al B99897/54 (lesions)
Cortisone (long term) ↑ in rabbit
Constantinides et al C2743/55 (*weight/body weight*)
Cortisone in rat
Bodansky and Money B96571/54 (*weight/body weight*)
Clark and Colburn C2754/55 (weight)
Cortisone+DOCA+Nephrectomy (partial)+NaCl in rat
Salgado C1002/54 (weight histology)
Cortisone+*Thyroid extract in rat*
Greenberg and Aterman C5361/55 (weight)
Cortisone Ø+Nephrectomy (partial) in rat
Schaffenburg et al C443/54 (weight)
Cortisone+*Nephrectomy* (partial)+Renin+NaCl in rat
Masson C5666/54 (histology)
Cortisone Ø+Bacterial toxin+Iron saccharate (*colloidal*) in rabbit
Thomas and Smith B98159/54 (necrosis)
Cortisone+*Monilia*+Stress in rat
Cavallero C829/54 (infectious foci)
Cortisone+Trauma in rat
Morton and Friedman C2698/54 (function histology)
Cortisone+Serum (antikidney) in rabbit
Lange et al C5266/55 (experimental nephritis)
Cortisone+Serum (antikidney) in rat
Lampert and Cheli B97933/54 (*histology*)
Lange et al C5266/55 (experimental nephritis)
Cortisone+Heparin ↓ in rabbit
Rosen et al B99897/54 (lesions)
Cortisone+NaCl in dog
Soffer C6132/54 (function)
Cortisone+NaCl+Potassium in dog
Giebisch and MacLeod C5093/55 (function)
Cortisone+Protein ↑ in rat
Tremolieres et al C1924/54 (weight)
Cortisone+Water load+Na deficiency in man
Raisz et al C4079/55 (function)
Cortisone+Diet starvation in hamster
Knigge C3678/55 (weight)
Cortisol in dog
Lambert and Gregoire C3379/54 (function)
Cortisol+Trauma in rat
Morton and Friedman C2698/54 (function histology)
Cortisol+Water load+Na deficiency in man
Raisz et al C4079/55 (function)
9α chlorocortisol+DOCA+Nephrectomy (partial) in rat
Friedman et al C6330/55 (weight histology)
9α chlorocortisol+Nephrectomy (partial) in rat
Friedman et al C6330/55 (weight histology)
9α chlorocortisol+Nephrectomy (partial) +NaCl in rat
Selye B98967/55 (histology)
9α fluorocortisol+Nephrectomy (partial)+NaCl in rat
Selye B98967/55 (histology)
DOCA in dog
Lambert and Gregoire C3379/54 (function)
DOCA in hamster
Knigge C263/54 (histology)
DOCA ↑ in hamster
Knigge C_63/54 (weight)
DOCA in man
Benda et al B98944/52 (function)
DOCA in rabbit
Binda and Tossenti B93466/53 (histology)
DOCA ↑ in rat
Gardner et al B98707/54 (weight)

Trauma, in rat
Morton and Friedman C2698/54
(function histology)
Aorta irritation (*croton oil subadventitially*)
in dog guinea pig and rabbit
Benelli et al C99142/53 (lesion)
Aorta irritation (croton oil subadventitially)
+ABA (promethazine) ↓ in dog,
guinea pig and rabbit
Benelli et al. B99142/53 (lesion)
Pylorus ligature *in cat*
Kadas C3990/53 (histology)
Pylorus ligature in rat
Lambling et al C5480/53
(*histology*)
Hemorrhage in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Hemorrhage+Blood (reinfused)
glucose in dog
Watson et al C5701/55 (function)
Burns in mouse
Bing and Knudsen C4876/54
(vessel contraction)
Cold, in dog
Nungesser C5128/55 (function)
Hypothermia, in dog
Page C5960/55 (function)
Hibernation (artificial) ↓ in dog
Bergstrand and Sterky C2692/54
(function)
Juvenelle et al C2689/53
(function)
Ionizing rays+Hypoxia in rat
Lamson et al C5316/55
(*nephrosclerosis*)
Ultrasound in guinea pig
Introna C4806/53 (histology)
Nerves (emotions) in man
Schottstaedt et al C4151/55
(function)
Nerves (emotions) in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Muscular exercise in man
Freeman et al C6780/55 (*function*)
Muscular exercise in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Hypoxia in mouse
Bing and Knudsen C4876/54
(vessel contraction)
Serum (antikidney antiplacenta) in dog
Bevans et al C5296/55
Serum (bovine)+Exudate (pleural)
in rabbit
Hayashi et al C6083/55 (histology)
Serum (anti-rabbit kidney duck)+
Exudate in rabbit
Hayashi et al. C6265/53
(nephritis)

Serum (horse)+Pyrogen (bacterial)
in rabbit
Bennett et al. B99815/53
(histology)
ABA (various) in dog
Handley and Moyer B97927/54
C2662/55 (function)
Moyer et al C2474/55 (function)
ABA (various) in man
Handley and Moyer B97927/54
(function)
ABA (apresoline) in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Anesthetic ↓+Synthalin A
Davis B98102/54
(histology damage)
Anesthetic+Water load, in dog
West and Keller C2663/55
(function)
Anesthetic+Dehydration in dog
West and Keller C2663/55
(*function*)
Angiotonin in man
Nickel et al C458/54 (function)
Drugs (*SC-4473 SC-3402*) in rat
Sturtevant C2757/55 (weight)
Egg white (i p) in rat
Scheiffarth and *Berg* B99788/53
(histology)
Egg albumen+Vitamin D in rat
Loustalot C6633/55 (*histology*)
Foam rubber (i p) in rat
Pecchiai C9/54 (histology)
Heparin ↑ in rabbit
de Matteis B97350/54 (weight)
NaCl in rat
Ball et al C2167/54 (weight)
NaCl (*hypertonic*) in dog
Soffer C6132/54 (function)
Protein (foreign) in rabbit
Mellors et al C5918/55 (*histology*)
Pyrogen in dog
Brandt et al. C5058/55 (function)
Serotonin Ø in dog
Corcoran et al. B96248/54
(function)
Urea in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Urethane in rabbit
Rona C1558/53 (nephrosclerosis)
Water (*distilled*) in rat
Still and Whitcomb B98990/54
(shunt mechanisms)
Starvation in hamster
Knigge C3678/55 (weight)
Starvation in rat
Ventura and Selye C1531/55
(weight)
Dehydration, in cat
Kadas C3990/53 (*histology*)

Testoids + Trauma in rat
Morton and Friedman C2698/54
(function histology)
Testoids Ø + Serum (antikidney) in rat
Lamperi and Cheli B97932/54
(histology)
Testoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Testoids + *Sublimate* in rabbit
Sarre B99950/54 (histology)
Testoids + Uranyl acetate in rabbit
Sarre B99950/54 (histology)
Testoids Ø + Uranyl nitrate in rat
Lamperi and Cheli B97932/54
(histology)
Testoids + Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
MAD in rat
Loustalot C6633/55 (histology)
MAD ↑ in rat
de Matteis et al B97490/54
(weight)
MAD + Thyroidectomy + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54
(weight histology)
MAD + *Nephrectomy (partial) + Renin* + NaCl in rat
Masson et al C4482/55
MAD + NaCl + Urea in rat
Skelton C5313/55 (weight)
Androstenediol in man
Trieger C2949/54 (function)
Thyroidectomy + Nephrectomy (partial) + NaCl in rat
Salgado C1002/54 B98385/54
(weight histology)
Thyroidectomy + *Renal lesion* + Prostatectomy in rat
Martin and Lehr C5274/55
(histology)
Thyroxin ↑ + Nephrectomy (partial) in rat
Dragoni C2426/54
(weight function)
Thyroxin + Casein + Protein deficiency *in rat*
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Thyroxin + Protein deficiency in rat
Aschkenasy and Dray B99606 54
(weight)
Glucagon ↑ in rat
Cavallero et al C2058/53 (weight)
Nephrectomy (partial) ↑ in rat
Braun Menendez B99353/54
(weight)
Nephrectomy (partial) + ERH (kidney *vessel ligature*) in dog
Daniel et al C1061/54
(blood flow histology)

Nephrectomy (partial) + ERH (kidney vessel ligature) in rabbit
Daniel et al C1063/54
(blood flow histology)
Nephrectomy (partial) + Kidney vessel ligature + NaCl in rat
Loustalot C6633/55 (*histology*)
Nephrectomy (partial) + ERH (kidney encapsulation) in rat
Bohle et al B99554/53
(*epitheloid cells*)
Nephrectomy (partial) + ERH (kidney wrapping) in rat
Eger and Gothe B99215/54
(*nuclear size*)
Nephrectomy (partial) + Renin in rat
Page and Clendening C5444/55
(function histology)
Nephrectomy (partial) + Renin ↓ in rat
Schaffenburg et al C443/54
(weight)
Nephrectomy (partial) + Dinitrophenol Ø in rat
Schaffenburg et al C443/54
(weight)
Nephrectomy (partial) + NaCl *in rat*
Page and Glendening C5444/55
(function histology)
Kidney vessel ligature (temporary) in rat
Opitz et al B99917/53 (*histology*)
Kidney denervation (partial) + Hemorrhage + ABA (hexamethonium) + *Blood (retransfusion of the shed blood)* in dog
Goodyer and Jaeger C2473/55
(function)
Renal lesion + Drugs (acidifying) in rat
Lehr and Milora C5268/55
(histology)
Nephrotoxin + *Heparin* in rat
Sarre B99950/54 (*histology*)
Age (senile) in dog
Landi C5875/54 (histology)
Age (senile) ↓ in rabbit
Smith and Thomas *C242/54*
(*Shwartzman phenomenon*)
Age (infant) in rat
Falk C5964/55 (function)
Age in rat
Loustalot C6633/55 (histology)

Kidney ← Stressors

Bacteria + Polysaccharides in rabbit
Glynn and Holborow C5033/52
(*nephritis*)
Trauma in man
Hira Juma B97662/52 C97663/53
(*function degenerative changes*)
Trauma in mouse
Bing and Knudsen C4876/54
(vessel contraction)

Glomerulonephritis → Blood pressure ← ACTH
Schmid et al C1498/54
Glomerulonephritis → Steroids in blood urine
Corsini C6671/55
Glomerulonephrosis → Steroids in blood urine
Corsini C6671/55
Nephritis—Pathogenesis
Langeron et al B98413/53 (ACTH and/or cortisone)
Reubi C3513/54 (adrenals)
Nephritis ← ACTH+Pulmonary asthma
Langeron et al C8102/54 (acute)
Nephritis ← Folliculoids+Testoids
Sarre B99930/54 (nephrotic)
Nephritis ← Malaria
Porter C1031/54
Nephritis ↑ → *Vasopressin in blood*
Taubert C5818/54 (chronic)
Nephritis ↑ → Hypertensin in blood
Arneil and Deganski C450/54
Nephritis → Blood pressure ← ABA (apresoline) ↓
McCrory and Rapoport B96785/53 (acute)
Nephritis (salt losing)—Pathogenesis (adrenals)
Joiner and Thorne B96786/52
Milliez et al B96833/54
Nephritis (salt losing) → Na/potassium ratio in urine ← *ACTH (gelatin)*
Nabarro B99930/54
Nephritis (salt losing) → 17 KS in urine ← *ACTH (gelatin)*
Nabarro B99930/54 *
Nephritis (salt losing) → Eosinophils *in blood* ← ACTH (gelatin)
Nabarro B99930/54
Nephritis (Na losing) → Aldosterone *in urine*
Luetscher and Curtis C4073/55
Nephritis (potassium losing)—Pathogenesis (primary aldosteronism)
Cope and Milne C6067/55
Nephropathy (diabetic)—Pathogenesis (adrenals pantothenic acid vitamin B_{12})
Becker et al B97145/54
Nephropathy (diabetic) ← Adrenalectomy +Cortisone+DOCA
Martin and Wilson C954/54
Nephropathy (senile) ← Testoids
Maffia C3946/53
Nephrosclerosis—Pathogenesis (adrenal cortical adenoma)
Frazier C6491/55
Polycystic kidney ← Cortisol
Farnsworth C3461/54
Polycystic kidney → NaCl *in blood* ← Cortisol ↑
Farnsworth C3461/54

Renal failure (postoperative) ← ACTH and/or cortisone
Haschek and Hermanek B99244/53 (discussion)
Renal failure → Corticoids in blood (free and conjugated)
Klein et al C1819/55
Renal glucosuria → Glucose in urine ← Cortisol ↑
Renold et al C4080/55
Renal insufficiency ← Folliculoids+Testoids
Engelhardt *Golkel* C4570/55
Renal insufficiency ↓ → *Adrenal (size of* adrenal medulla)
Trabucco et al B97759/52
Renal insufficiency ↑ → Adrenal (size of glomerulosa)
Trabucco et al B97759/52
Urolithiasis—Pathogenesis (stress)
Burkland C5884/54
Various renal diseases—Pathogenesis (cold)
Giraud C4832/54
Various renal diseases ← Cortisone
Luetscher B98180/54 (review)
Various renal diseases ← Nephrectomy *(partial)*+*Dextran*
Moeller C4001/55
Various renal diseases ← Na deficiency
Anonymous C1035/54 (discussion)
Various renal diseases → Vasopressin *in* body fluids
Seavo C4930/54 (discussion)
Various *renal diseases* → Skin (urticaria edematous reactions) ← Dextran
Moeller C4001/55

RESPIRATORY SYSTEM

(For earlier pertinent data cf also Stress pp 642-650 AROS 1951 pp 372-379 AROS 1952 pp 241-246 AROS 1953 pp 312-316 AROS 1954 pp 470-473)

Lungs ← Stimuli

Vagotomy+Hypothalamus lesion adrenal demedullation ↓ thyroidectomy ∅ in rat
Tigyi and Lissak C2143/54 (edema formation)
Vagotomy+ABA (dibenamine ergot) ∅ in guinea pig
Schmitt and Meyers C5287/55 *(weight)*
Hypothalamus stimulation in guinea pig
Chevreau et al C3113/53 *(histology)*
Hypophysectomy+STH+Tuberculosis in rat
Lemonde C310/54 (histology)

Dehydration in rat
Still and Whitcomb B98990/54
(shunt mechanisms)

RENAL DISEASES

Nephrotic Syndrome

Pathogenesis (ACTH and/or cortisone)
Layani and Sichere C_954/54

Nephrotic Syndrome ← Stimuli

ACTH and/or cortisone
Althoff and Kropp C5541/54
Borremans B97907/54
(intramuscular drip)
Brofman et al C2198/55
Hooft and Clara B99895/54
LaDue B97334/54 (discussion)
Lange et al C4176/55
Langeron et al B98413/53
de Lerner B97906/54
Linneweh C3722/55 (discussion)
Luetscher B97180/54 (review)
Medalie and Bloomberg C352/54
Riley C6228/55
Rupp et al C3495/54 (review)
Thibaudeau B98414/53
ACTH and/or cortisone + Ion exchange resins
Celice et al B97772/53
(nephrotic oedema)
ACTH + Cation exchange
Kraupp and Zweymuller B97898/53
ACTH + NaCl deficiency
de Assis et al C22_2/54
Cortisol
Riley C6228/55
Testoids
Derot B98412/53
Moench and Sartorius C2953/54
Malaria
Byrne C6438/55
Shaper C6256/55

Nephrotic Syndrome → Targets

Glucose in urine ← *ACTH*
Rupp et al C3495/54
Nitrogen in blood urine ← ACTH
Rupp et al C3495/54
Protein in blood urine ← *ACTH*
Rupp et al C3495/54
Protein in blood ← ACTH
Stickler et al B99421/54
Albumin in blood ← ACTH
de Assis and Oliveira C2223/54
Amino acid in urine ← ACTH ↓
Shreeve et al C4563/55
Na in urine ← *ACTH* ↓↑
Kraupp and Zweymuller B97898/53
Kraupp et al B97897/54
Na in urine ← ACTH + Cation exchange ↑
Kraupp and Zweymuller B97898/53
Kraupp et al B97897/54
NaCl in blood, urine ← ACTH
Rupp et al C3495/54
Ø Na/potassium ratio in saliva
Prader et al C3655/55
Potassium in blood urine ← ACTH
Rupp et al C3495/54
Phosphorus in blood ← ACTH
de Assis and de Oliveira C22_3/54
Diuresis ← ACTH
Kraupp and Zweymuller B97898/53
Stickler et al B99421/54
Diuresis ← ACTH + Cation exchange ↑
Kraupp and Zweymuller B97898/53
↓ Cortisol in blood ← Cortisol
Farnsworth C3461/54
↑ Aldosterone in urine
Axelrad et al C6372/55 (increased when urinary sodium was low)
Ehrengut C2961/54
Luetscher and Johnson B99409/54
Luetscher et al C3063/54
Venning et al C3644/55
Adrenals ← ACTH
Landing C3636/55
(histology of zones)
Adrenals ← (ACTH + Agony) ↓
Landing and Feriozi B97414/54
(fat)
Adrenals ← (ACTH + Agony) ↑
Landing and Feriozi B97414/54
(weight, size of zones)
Blood pressure ← ACTH ↑
Kraupp and Zweymuller B97898/53
Kraupp et al B97897/54
Blood pressure ← ACTH + Cation exchange
Kraupp and Zweymuller B97898/53
Kraupp et al B97897/54
Complement in blood ← ACTH cortisone
Lange et al C4176/55
Growth ← ACTH
de Assis and Oliveira C2223/54

Other Renal Diseases

Coma (renal) → 17 hydroxycorticoids in blood
Engel et al C1913/55
Coma (renal) → *Eosinophils in blood*
Engel et al C1913/55
Glomerulonephritis–Pathogenesis
(Hypophyseal tumor)
Langeron et al C5030/54
Glomerulonephritis ← Hypophysectomy
Luft et al C6210/52
Glomerulonephritis ← *ACTH*
Stotz and Hesz B97828/53
(nephrotic)

Cortisone+Ionizing rays in man
Friedenberg and Kubenfeld B98542/54 (prevention of fibrosis)
Cortisone+Ionizing rays in rat
Toolan B96597/54 (growth of human embryonic tissue—transplant)
Cortisone ↑+Oxygen in rat
Smith and Bean C5538/55 (damage)
Cortisone ↓+Antigen in guinea pig
Winter and Flataker C1524/55 (cough in sensitized animal)
Cortisone ↓+ABA (antihistamine)+Antigen in guinea pig
Winter and Flataker C1524/55 (cough in sensitized animals)
Cortisone+Antibiotic in rat
Lemonde C310/54 (histology)
Cortisone+Silicosis in rat
Marenghi and Rota B99315/53 (histology)
Stacy and King C5027/54 (histology)
DOCA
Loeschcke C4664/54 (function)
DOCA, in rat
Tigyi et al C4663/54 (pneumonia)
DOCA+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (tuberculosis)
DOCA+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al. B99116/54 (tuberculosis)
Folliculoids
Loeschcke C4664/54 (function)
Folliculoids Ø in rat
Tigyi et al C4663/54 (pneumonia)
Folliculoids+Egg albumin in rat
Gross C5785/54 (function)
Luteoids
Colomer C3948/54 (function—discussion)
Loeschcke C4664/54 (function)
Luteoids ↓ in rat
Tigyi et al. C4663/54 (pneumonia)
Luteoids+Egg albumen, in rat
Gross C5785/54 (function)
Testoids
Loeschcke C4664/54 (function)
Testoids Ø in rat
Tigyi et al. C4663/54 (pneumonia)
Steroids+Oxygen in guinea pig
Bruns and Shields C5872/54

Lungs ← Stressors

Cold, in dog
Spurr et al. B97923/54 B99498/54 (function)
Hibernation (artificial) in dog
Juvenelle et al. C2688/54 (function)
Oxygen (high pressure)+ABA (SKF 501) ↓+Carbon dioxide in rat
Johnson and Bean C5109/55 (damage)
Oxygen (high pressure)+Carbon dioxide ↑ in rat
Johnson and Bean C5109/55 (damage)
Antigen+ABA (antihistamine) ↓ in guinea pig
Winter and Flataker C1524/55 (cough in sensitized animals)
ABA (atropine) ↓+Acetylcholine in guinea pig
Friebel and Flick B98901/54 (asthma)
ABA (various) ↓+Thiosemicarbazide in rat
Tennekoon C757/54 (edema)
Ammonium chloride (i p)+Anesthetic (procaine i p) ↓ in rat
Gottsegen et al C714/54 (edema)
Anesthetic (barbiturate)+Serotonin ↑ in dog
MacCanon and Horvath B99596/54 (function)
Protein (foreign) in rabbit
Mellors et al C5918/55 (histology)
Diurnal variations in mouse
Bander C3745/53 (function)

RESPIRATORY DISEASES

Asthma

Reviews
Noelpp-Eschenhagen and Noelpp C3409/55 (experimental asthma)
Rose C5581/55
Pathogenesis
Hale B98909/54 (hypophyseal posterior lobe hormone)
Macaulay B98577/54 (antihistamine)
McDowall B96532/53 (adrenals)
Woodard B98201/54 (adrenal medulla)

Asthma ← Various

Hypophyseal posterior lobe transplant
Okada and Ninomiya C5032/53
ACTH and/or cortisone
Anonymous B98493/54
Anonymous C6374/55 (discussion)
Arbesman B98972/54 (discussion)
Arbesman and Richard B99511/54

ACTH
Loeschcke C4664/54 (function)
ACTH *in man*
Koepchen et al *C4C65/54*
(function)
ACTH+STH+Tuberculosis in mouse
Lemonde C310/54 (histology)
ACTH Ø+Adrenaline in rabbit
Serafini and Scapellato C1497/52
(edema formation)
ACTH Ø+Pregnancy in monkey
Schmidt and Hoffmann B96565/54
ACTH (to mother) Ø+Pregnancy+Age
(foetal) in monkey
Schmidt and Hoffmann B96565/54
ACTH+Oxygen in guinea pig
Bruns and Shields C5872/54
ACTH Ø+Anaphylactogen histamine
(inhaled) in guinea pig
Noelpp Eschenhagen and Noelpp
C3409/55 (experimental asthma)
STH+Adrenalectomy+Tuberculosis
in mouse
Lemonde C310/54 (histology)
STH+Cortisone+Tuberculosis+Antibiotic
in rat
Lemonde C310/54 (histology)
STH+DOCA+Tuberculosis in mouse
Lemonde C310/54 (histology)
STH+Tuberculosis in guinea pig
Besta et al B99116/54
(tuberculosis)
Chirico et al C5040/54
(tuberculosis)
STH+*Tuberculosis in mouse*
Lemonde C310/54 (histology)
STH+Tuberculosis+Isonicotinic acid
hydrazide in guinea pig
Besta et al B99116/54
(tuberculosis)
Adrenalectomy+Adrenaline ↑+Oxygen
(high pressure) in rat
Bean and Johnson C4537/55
(damage)
Adrenalectomy+Cortisone+Testis
extirpation in rat
Tremolieres et al C1924/54
(weight)
Adrenalectomy ↓+Oxygen in rat
Smith and Bean C5338/55
(*damage*)
Adrenalectomy ↓+Oxygen (high pressure)
in rat
Bean and Johnson C4537/55
(*damage*)
Adrenalectomy Ø+ Thiosemicarbazide
in rat
Tennekoon C757/54 (edema)
Adrenaline ↑ in guinea pig
Borca C2583/52 (edema)
Adrenaline in mouse
Davis and Williams C5300/55
(edema)

Adrenaline in rabbit
Abelli B96368/53
Adrenaline+Testis extirpation ↓
in guinea pig
Bongioanni and Canavese C5526/54
(edema)
Adrenaline ↑+Oxygen (high pressure)
in rat
Bean and Johnson C4537/55
(damage)
Adrenaline ↑+Oxygen in rat
Smith and Bean C5338/55
(damage)
Adrenaline+ABA (antihistamine) ↓
in guinea pig
Bollattino C2585/52 (edema)
Adrenaline+ABA (opilon) in rabbit
Testoni and Lomeo C6153/54
(edema)
Adrenaline+Acetylcholine in guinea pig
Friebel and Flick B98901/54
(asthma)
Adrenaline ↓+Anesthetic (xylocaine)
in guinea pig
Wieldling C1067/52 (function)
Adrenaline+Histamine ↓ in guinea pig
Borca C2583/52 (edema)
Adrenaline+Histamine in rabbit
Banety et al C503/53 (edema)
Adrenaline+N Alkyl piperidyl benzhydryl
aether in rat
Niesschulz and Scheuermann
C4784/55 (edema)
Noradrenaline in rabbit
Korner B99791/53 (edema)
Cortisone
Loeschcke C4664/54 (function)
Cortisone (intracisternally) in cat
Samueloff and Feldman C3064/54
(function)
Cortisone in guinea pig and rabbit
Businco B99102/54 (larynx
lung histology)
Cortisone ↑ in hamster
Toolan B96597/54 (growth of
human embryonic tissue—
transplant)
Cortisone in rat
Tigyi et al C4663/54 (pneumonia)
Cortisone ↑+*Actinomyces* in rat
Ilantoni B96907/53 (mycosis)
Cortisone ↑+Tuberculosis in guinea pig
Besta and Valenti B99115/52
B99119/53 (tuberculosis)
Cortisone+Tuberculosis+Antibiotic
in rat
Lemonde C310/54 (histology)
Cortisone ↑+Tuberculosis+Isonicotinic
acid hydrazide in guinea pig
Besta et al B99116/54
(tuberculosis)

Barach B98543/54 (review)
Bernstein and Klotz C6074/55 (discussion)
Burrage et al C3859/55
Danilovic et al C5787/54
Diamant and Kallós C3034/54 (cortisone intrabronchial)
Ehrlich et al C6656/55
Herxheimer C6386/55
Kania and Schmidt B99882/54
Kaufman and Feingold B97200/54 (discussion)
Kruger C3033/53 (ACTH long acting)
MacPherson C6255/55 (discussion)
Melli and Zanussi C6073/54
Mora C5790/54 C6076/53
Pearson C6371/55
Rose B97172/54 (review)
Sagiorgi C6191/54
Savidge C6056/55
Savidge and Brockbank B99690/54 (cortisone long term)
B99691/54
Segal B97317/54 (discussion)
Silberkasten B98492/54
van Ufford C1459/53
Unger B98491/54 (discussion)
Valkry Radot et al C5791/54
Velez C5792/54
Verschoof C5789/54
Waldbott C4024/51
Zarate et al B98973/54
ACTH+Age (childhood)
Collins Williams C4523/55
ACTH+Nephritis
Langeron et al C6102/54
ACTH+Serum (Bogomoletz)
Lageze and Chavanis B99937/54
ACTH+Ascorbic acid+ATP
Vaccari and Baldini C5786/54
ACTH+Nitrogen mustard
Ballestero C3937/54
Adrenaline
Danilovic et al C5787/54
Sterling B98024/54 (critique)
Adrenaline+Water load
Kaufman and Feingold B97200/54
Adrenaline precursor (tyrosin)
Woodard B98201/54
Cortisone+Age (childhood)
Collins Williams C4523/55
Cortisone+Serum (Bogomoletz)
Lageze and Chavanis *B99937/54*
Cortisone+Antibiotic
Finke C677/54 (infectious)
Cortisone withdrawal
Henneman et al. C5375/55
Cortisol
Arbesman B98972/54 (discussion)
Arbesman and Richard B99511/54
Burrage and Irwin C6-22/55
C6232/55 (cortisol i v)
Burrage et al C3859/55
Foulds et al C1785/55
di Nardo C4022/54
Wilhot and Cuche C3302/55 (cortisol inhaled)
Cortisol (intranasal) Ø+Rhinitis (allergic)
Smith B97849/54
9α fluorocortisol
Wakai and Prickman C837/54
Δ cortisone+Diet
Barach et al C6077/55
Testoids
Arnoldsson and Piplorn C5788/54
Icterus
Wiktor and Kedra *C4697/54*
Muscular exercise
Schutz C3624/55
ABA (prantal)
Dann et al B96539/53
ATP
Perez B96825/53
Chloramine
Valeri and di Raimondo B98479/53
Nitrogen mustard
Waldbott C3031/53
Phenylbutazone
Platoff B96520/53
Diacephalorachidian therapy
Boschi C467/52
Nonspecific Therapy
Mallen B96971/54

Asthma → Targets

Oxygen in blood ← Adrenaline
Lowell et al B96538/53
Na potassium in blood ← Muscular exercise
Koster et al C4681/54
↓ Corticoids in urine (reducing)
Andersson B99323/53
11 oxycorticoids in urine ← Muscular exercise
Koster et al. C4681/54
↓ 17 KS in urine
Andersson B99323/53
17 KS in urine ← Muscular exercise
Koster et al C4681/54
Histamine (free) in urine ← Cortisone ↑
Mitchell et al C4026/54
Eosinophils in blood ← ACTH adrenaline insulin
Koster et al C4681/54
Eosinophils in blood ← Histamine
Andersson B99323/53

Tuberculosis

Review
Lemonde C310/54
Pathogenesis (G A S)
Bottone and Cipolloni C1984/51

Hypophysectomy in rat
Baker and Abrams C-6-4/54
(stomach mucosa)
Leblond and Carriere C2755/55
(mitosis of intestinal mucosa)
Hypophysectomy+ACTH in dog
Forrua et al. C4858/54
(stomach function secretion)
Hypophysectomy+STH in rat
Baker and Abrams C4-37/55
(stomach secretion histology
salivary glands)
Hypophysectomy+STH+LTH+
Ovariectomy+Folliculoids+
Luteoids in rat
Souders C5152/55
(small intestine weight)
Hypophysectomy+STH ↑+Thyroidectomy
+Thyroxin in rat
Leblond and Carriere C2758/55
(mitosis of intestinal mucosa)
Hypophysectomy+LTH+Diet in pigeon
Riddle C4976/55 (weight)
Hypophysectomy+Cortisone ↓
(discussion)
Baker C5933/55 (stomach
function, zymogenic cells)
Hypophysectomy+Cortisone, in dog
Castro-Rial et al C4817/54
(stomach secretion)
Hypophysectomy+Cortisone in rat
Baker and Abrams C4237/55
(stomach secretion, histology
salivary glands)
Hypophysectomy+Cortisol (discussion)
Baker C5933/55 (stomach
function zymogenic cells)
Hypophysectomy+Thyroxin Ø in rat
Leblond and Carriere C2758/55
(mitosis of intestinal mucosa)
ACTH in dog
Villarreal et al. C1664/54
(stomach secretion)
ACTH in man
Hirschowitz et al C4429/55
(stomach secretion)
Marchal et al. C2422/54
(intestinal perforation)
Wollaeger C6079/54 (ulcers)
ACTH ↓ in rat
Sforzini C3833/54 (mitosis in
crypts of Lieberkuhn)
ACTH+Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach
secretion)
Remouchamps C3378/54 (stomach
ulceration, stomach secretion)
Remouchamps and Merckx C3103/54
(appearance of gastric ulcers)
STH ↓ in man
Schiavetti and Ferraris C3898/53
(acidity of stomach secretion)
STH Ø in rat
Sforzini C5833/54
(mitosis in crypts of Lieberkuhn)
STH ↑+Thyroidectomy+Thyroxin in rat
Leblond and Carriere C2758/55
(mitosis in intestinal mucosa)
STH ↓+Histamine in guinea pig
Lofgren C1397/54
(gastric ulcer formation)
Hypophyseal posterior lobe extract ↓+
ABA (antihistamine)+Histamine
in guinea pig
Kowalewski and Bain C5697/54
(ulcer formation)
Hypophyseal posterior lobe extract Ø+
Histamine in guinea pig
Kowalewski B98985/54
(acidity of stomach secretion)
Hypophyseal posterior lobe extract ↓+
Histamine in guinea pig
Kowalewski B98985/54
(ulcer formation)
Vasopressin in rabbit
Crane C-421/54 (stomach lesion)
Adrenalectomy in rat
Baker and Bridgman B97091/54
(gastrointestinal mucosa–review)
Adrenalectomy+Cortisone+DOCA+
Pylorus ligature in rat
Remouchamps C3378/54 (stomach
ulceration stomach secretion)
Adrenaline ↑ in man
Scaffidi B99501/53 (hydrochloric
acid secretion of stomach)
Scaffidi and di Bella B99327/54
(stomach secretion)
Adrenaline+DOC in cat
Toth et al C3760/54
(intestine contractions in vitro)
Adrenaline+ABA (cholinergic) ↓ in man
Scaffidi and di Bella B99327/54
(stomach secretion)
Corticoids+ABA (antihistamine) histamine
in guinea pig
Gilerti and Borghi C-078/54
(ulcer formation)
Cortisone in dog
Janowitz et al. C5107/55
(healing of experimental ulcer)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↑ in hamster
Toolan B96597/54 (growth of
human embryonic tissue transplant)
Cortisone in man
Guard C1954/54
(cells in oral mucosa)
Wollaeger C6079/54 (ulcers)
Cortisone in rabbit
Businco B99102/54 (histology)
Cortisone in rat
Baker and Bridgman B97091/54
(gastrointestinal mucosa–review)

Other Diseases of Respiratory Organs

Acidosis (respiratory) ← ACTH and/or cortisone
Cohn et al C6258/54
Allergy (gold) ← ACTH
Bjorkman B96536/53
Allergy ← Respiratory re education
Roloff B99324/54
Anthracose ← Cortisol (inhaled)
Wilhot and Cuche C3302/55
Beryllosis ← Cortisone
Sprague and Hardy B99570/54
Bronchial cancer → Joints
Semple and McCluskie C6121/55
Bronchial spasm ← ACTH
Adams and Sounders C6699/54
Emphysema ← ACTH and/or cortisone
Adams and Sounders C6699/54
Comeau and Bilodeau B99571/54 (discussion)
Emphysema ← Cortisol (inhaled)
Wilhot and Cuche C3302/55
Hyaline membrane disease–Pathogenesis (steroids)
Bruns and Shields C5872/54
Lung abscess ↓ → Spreading (after hemoglobin + hyaluronidase)
Mahaux B97086/54
Pleurisy (eosinophilic Loeffler) ← Cortisone
Turiaf and Blanchon C5728/54
Pleurisy (eosinophilic) → Eosinophils in blood pleural fluid ← ACTH (intrapleurally) ↓
Pende C1270/53
Pleuritis ← ACTH (systemically and locally)
Scalabrino B99447/54
Pleuritis ← Cortisol (locally)
Ballabio and Sala B98828/54 (rheumatic)
Balabio et al B98622/54
Castellana and Rizzi C566/54
Gabusi C567/54
Scalabrino B99447/54
Wilhot and Cuche C3302/55
Pleuropericarditis (asthmatic) ← ACTH
de Leobardy and Blanc B99325/53
Pneumonia–Pathogenesis (ACTH and/or cortisone treatment)
Fletcher and Rose B99932/54
Komor and Koch C4016/54
Page C299/54
Pneumonia (anaphylactic) ← ACTH and/or cortisone
Waldbott C4024/54
Pneumonia ↓ → Ascorbic acid in blood
Chakrabarti and Banerjee C4551/55
Pneumonia ↑ → Dehydroascorbic acid in blood
Chakrabarti and Banerjee C4551/55
Pneumonia ↓ → Spreading (after hemoglobin and hyaluronidase)
Mahaux B97086/54
Pneumonitis (ionizing rays) ← ACTH
Whitfield et al C4292/54
Pulmonary edema (chronic) ← ACTH and/or cortisone
Segal et al B97880/54 (discussion)
Pulmonary edema ← Hibernation (artificial)
Decortis C3887/54
Pulmonary fibrosis ← ACTH and/or cortisone
DuBose et al B97881/54
Respiratory infection ← Cortisone (discussion)
Sako B97882/54
Respiratory insufficiency (bronchial) ← ACTH and/or cortisone
Bour C341/54
Sarcoidosis ← Cortisone + Antibiotic
Hoyle et al C3609/55
Silicosis ← Nerves (conditioned reflex) + ACTH
Michalova C4764/54
Silicosis Ø → Diuresis ← Water load
Camerada and Leo C1871/53
Silicosis → 17 KS in urine
Camerada and Leo C1870/53
Silicosis → Blood count ← Adrenaline
Camerada and Leo C1869/53 (eosinophils)
Various pulmonary diseases → Joints
Wierman et al C4691/54

GASTROINTESTINAL SYSTEM

(For earlier pertinent data cf also *Stress* pp 688 707 AROS 1951 pp 403-413 AROS 1952 p 260 AROS 1953 pp 331-333 AROS 1954 pp 485 488)

Gastrointestinal System ← Stimuli

Nerves (vagotomy)
Lagrot and Greco B99164/53 (review)
Hypothalamus stimulation in cat
Anand and Dua C6202/55 (stomach secretion)
Hypophysectomy (discussion)
Baker C7933/55 (stomach function zymogenic cells)
Hypophysectomy ↓ in dog
de Salamanca et al B96917/53 (gastric function)

Atophan ↑ in dog
Giusti and Tomatis B99543/53
(gastric ulcer formation)
Matveyeva and Nilova B99544/53
(gastric ulcer formation)
Phenylbutazone ↑ in man
Platoff B96520/53
(appearance of bleeding)
Siguier et al. B96523/53
(appearance of bleeding)
Histamine ↑ in guinea pig
Kowalewski B96750/54
(gastric ulcer formation)
Histamine+Liquorice Ø in guinea pig
Capretti and Magnani B96780/53
(stomach ulcer formation)
Histamine+Pantothenic acid deficiency in man
Thornton et al. C6778/55
(stomach secretion)
Fasting in man
Guiard C1954/54
(cells in oral mucosa)
Amino acid deficiency
Csalay et al. C4908/54
(eosinophils in stomach)
Dehydration ↓ in rat
Kerpel-Fronius et al. C2140/54
(gastrointestinal motility)

Gastrointestinal Diseases

(For additional data cf. also teeth and gum diseases)

Appendicitis–Pathogenesis
Gylling C759/54 (G-A S)
Ribeiro C2271/55 (emotions)
Appendicitis (acute) ↓ → Eosinophils in blood
Brennhovd and Lied B96320/54
Diarrhea ↓ → 17 KS in urine
de Gennes C1118/54
Enteritis (regional) ← ACTH and/or cortisone
Antognetti et al. C348/53
(discussion)
Dunbar C650/54
Enterocolitis (pseudomembranous postoperative) ← ACTH
van Prohaska et al. B98410/54
Enterocolitis (pseudomembranous) ← Cortisol+Noradrenaline+Antibiotic +Blood transfusion
Nyhus and Burke B97901/54
Esophagitis (corrosive) ← ACTH and/or cortisone
Dagradi and Stempien B97850/54
Gastroduodenal ulcer
Kirsner B92503/53 (review)
Gastroduodenal ulcer–Pathogenesis
Anonymous C4108/55
(stress trauma to brain)
Bachman and Rogers C692/54
(perforation after cortisone)
Barrett B98405/53 (G-A S)
Baum C545/54 (season)
Bollet et al. C5838/55
(Δ^1-cortisone Δ^1-cortisol)
Christensen B99048/54
(phenylbutazone)
Firket et al. B96558/53
(G-A S allergy)
Gray B99556/54 (G-A S)
Hinard C1052/53 (hypophysis)
Hollander C18/54 (adrenals)
Ishihara B95643/54 (G-A S)
Kurotsu B97671/52
(hypothalamus)
Labra C2320/54 (G-A S)
Miller and Sandweiss C691/54
(cortisone)
Mears B99345/53 (burns heart infarct, trauma hypertension)
Morsiani and Lucci C620/53
(ACTH and/or cortisone)
Okabayashi B97670/52 (allergy)
Raskin and Hull C4993/54
(electroshocks)
Siurala and Tanka B98403/53
(nerves)
Venulet B96354/54
(adrenals ascorbic acid)
Gastroduodenal ulcer ← Hypophyseal extract
Hinard C1052/53
Gastroduodenal ulcer ← ACTH+Colitis
Chaiken et al. C349/53 (discussion)
Gastroduodenal ulcer ← STH
Schiavetti and Ferraris C5598/53
Gastroduodenal ulcer ← DOCA
Bojanowicz B96781/53
Gastroduodenal ulcer ← Nerves (hypnosis)
Moody B98406/53
Gastroduodenal ulcer ← Liquorice
Hajowsky and Schwander C1054/54
Hennemann et al. C1055/53
Revers B96649/53
Gastroduodenal ulcer ← Piromen
Olson and Necheles B98408/53
Gastroduodenal ulcer ↓ → GTH in urine, 17 KS in urine
Maggi et al. B96919/53
Gastroduodenal ulcer ↑ → Folliculoids in urine
Maggi et al. B6919/53
Gastroduodenal ulcer ↓ → Testoids in urine
Maggi et al. B96919/53
Gastroduodenal ulcer → Testis
Maggi et al. B96919/53
(histology)
Gastroduodenal ulcer Ø → Blood pressure
Siurala et al. B98404/54.

Cortisone ↓ in rat
Morsiani and Lucci C568/53
(mitosis)
Cortisone + Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach secretion)
Bemouchamps and Merckx C3103/54
(appearance of gastric ulcers)
Cortisone + Ionizing rays in rat
Toolan B96597/54 (growth of
human embryonic tissue—transplant)
Cortisol in rat
Baker and Bridgman B97091/54
(gastrointestinal mucosa—review)
Cortisol + Appendix perforation
(experimental) in rabbit
Zachariae C6460/55 (peritonitis)
Cortisol + Intestinal anastomosis
(experimental) in rabbit
Zachariae C6460/55 (peritonitis)
DOC + Acetylcholine histamine in cat
Toth et al C3780/54
(intestine contractions in vitro)
DOCA + Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach
secretion)
Ovariectomy + Pylorus ligature in rat
Antonsen C6004/55
(gastroduodenal ulcer)
Folliculoids ↑ + Testis extirpation +
Pylorus ligature in rat
Antonsen C6004/55
(gastroduodenal ulcer)
Folliculoids + Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach secretion)
Folliculoids ↓ + Tannic acid in rat
Sztanojevits et al C5481/54
(ulcer formation)
Luteoids (discussion)
Colomer C3948/54
Luteoids + Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach
secretion)
Sex (♀) ↑ + Pylorus ligature in rat
Antonsen C6004/55
(gastroduodenal ulcer)
Testis extirpation + Pylorus ligature in rat
Antonsen C6004/55
(gastroduodenal ulcer)
Testoids + Pylorus ligature in rat
van Geertruyden et al C3104/54
(ulcer formation stomach
secretion)
Δ pregnenolone + Acetylcholine in cat
Toth et al C3780/54
(intestine contractions in vitro)
Thyroidectomy ↓ in rat
Leblond and Carriere C2758/55
(mitosis of intestinal mucosa)

Thyroidectomy + Thyroxin ↑ in rat
Leblond and Carriere C2758/55
(mitosis of intestinal mucosa)
Thyroidectomy + Renal lesion (experimental)
+ Prostatectomy in rat
Lehr and Martin C5267/55 (gut)
Thiourea ↑ + Histamine in guinea pig
Kowalewski et al C6032/54
(gastroduodenal ulcer)
Insulin + Anesthetic (barbiturate) ↓
in dog
Varró and Oláh C716/54
(stomach secretion)
Insulin + Anesthetic (barbiturate) +
Histamine ↑ in dog
Varró and Oláh C716/54
(stomach secretion)
Insulin + Pantothenic acid deficiency in man
Thornton et al C6778/55
(stomach secretion)
Nephrectomy ↓ + Aorta irritation (croton
oil subadventitially) in dog
guinea pig and rabbit
Benelli et al B99142/53
(intestinal lesion)

Gastrointestinal System ←

Stressors

Aorta irritation (croton oil subadventitially)
in dog guinea pig and rabbit
Benelli et al B99142/53
(intestinal lesion)
Aorta irritation (croton oil
subadventitially) + ABA
(promethazine) ↓ in dog guinea
pig and rabbit
Benelli et al B99142/53
(intestinal lesion)
Pylorus ligature + *ABA (probanthine)* ↓
in rat
Kowalewski et al B99034/54
(ulcer stomach secretion)
Pylorus ligature + Salicylate ↓ in rat
Child et al C5242/55
(ulcer formation)
Renal lesion + Drugs (acidifying) in rat
Lehr and Mulora C5268/55
(stomach lesion)
Cold ↓ in rat
Kerpel Fronius et al C2140/54
(gastrointestinal motility)
Nerves (hypnosis emotions) in man
Holzien et al C3898/54
(stomach function)
Muscular exercise Ø in rat
Stickney et al C5153/55
(propulsive motility)
Muscular exercise ↓
Takaoka C5322/53 (saliva secretion)

SALIVARY GLANDS

(For earlier pertinent data cf also *Stress* pp 724 725 AROS 1951 p 417 AROS 1952 p 267 AROS 1953 p 338 AROS 1954 p 495)

Salivary Glands ← Various

Hypophysectomy (discussion)
Baker C5933/55 (zymogenic cells)
Hypophysectomy+Cortisone cortisol
Baker C5933/55 (zymogenic cells)
ACTH+Casein+Potassium chloride+ Protein deficiency in rat
Aschkenasy and Dray C1990/54
STH folliculoids testoids thyroxin+ Casein+Protein deficiency in rat
Aschkenasy and Dray C1990/54

DISEASES OF SALIVARY GLANDS

Sjogren s Syndrome

Sjogren s syndrome ← ACTH and/or cortisone
Achenbach and Stollberg B99953/54 (discussion)
Gaulhofer *B99577/54* (rheumatic)
Villaverde C3518/52
Sjogren s syndrome ← Cortisol
MacLean and Robinson B99949/54
Sjogren s syndrome → L E cells in blood
MacLean and Robinson B99949/54

LIVER

(For earlier pertinent data cf also *Stress* pp 708 724 AROS 1951 pp 414 416 AROS 1952 pp 264 266 AROS 1953 pp 334-337 AROS 1954 pp 489-492)

Generalities
Tyler et al B99414/54 (role in producing elevated plasma 17 hydroxycorticoid levels in surgery in man)

Liver ← Stimuli

Sympathicus ↓ (discussion)
Yamagata et al B97617/53 (RES function)
Vagus ↑ (discussion)
Yamagata et al B97617/53 (RES function)
Hypothalamus lesion
Soulairac et al C1110/53 (glycogen lipids)
Hypophysectomy in rat
Bass et al. C5969/55 (weight, ploidy class of nuclei)
Hypophysectomy+STH in fish
Pickford B974_6/54 (weight)
Hypophysectomy+STH in rat
Bass et al C5969/55 (weight ploidy class of nuclei)
Hypophysectomy+STH+LTH+ Ovariectomy+Folliculoids+ Luteoids in rat
Souders C5152/55 (weight)
Hypophysectomy+STH+Folic acid vitamin B_1 in rat
Penhos and Foglia C6746/54 (weight)
Hypophysectomy+Cortisone ↑ in rat
Greenberg and Aterman B99025/54 (weight/body weight)
Hypophysectomy+Folliculoids+Testis extirpation+Pancreatectomy (partial)+Diet (force fed) in rat
Foglia et al C4922/54 (weight)
Hypophysectomy+Testis extirpation+ Testoids+Pancreatectomy (partial) +Diet (force fed) in rat
Foglia *et* al C4922/54 (weight)
Hypophysectomy+Testoids+Carcinogen in rat
Firminger and Morris C5302/55 (cirrhosis)
Hypophysectomy+Alloxan in rabbit
Nagahama B96565/53 (fatty degeneration glycogen)
Hypophysectomy+Hepatectomy (partial) in rat
Fumagalli and Petrelli C1552/54 (weight histology PAS regeneration alkaline phosphatase)
Fumagalli et al C1553/54 (weight histology regeneration alkaline phosphatase)
Hypophysectomy+Croton oil (to hepatic hilus) in dog
Bernard et al C5482/53 (histology fat)
Hypophyseal anterior lobe extract in rabbit
Yamagata et al C5967/55 (function)
Hypophyseal anterior lobe extract+ Anesthetic (barbiturate) in rabbit
Yamagata et al C5967/55 (function)
ACTH in rabbit
Yamagata et al C5967/55 (function)
ACTH Ø+Pregnancy in monkey
Schmidt and Hoffmann B96565/54
ACTH+Hepatectomy (partial) in rat
Fumagalli C1551/54 (weight histology regeneration)
ACTH ↑+Hepatectomy (partial) in rat
Giberti and Bianchini C2079/54 (regeneration)
ACTH (to mother) *Ø+Pregnancy+Age* (foetal) in monkey
Schmidt and Hoffmann B96565/54
ACTH ↑+CCl_4 in rat
Ferrara et al C123/53 (damage)

Gastrointestinal obstruction Ø → Adrenals (histology)
Stoner et al B96395/53
Glossitis ← Cortisol (locally)
Horton C1492/55
Ileitis (regional) ← ACTH and/or cortisone
Lima B97300/54 (discussion)
Ileocolitis ← ACTH (long term)
Frenkel and Groen C3939/54
Lichen planus ← Cortisol (locally)
Robinson B99888/54
Lipodystrophy (intestinal) ← ACTH and/or cortisone
Lepore B97861/54
Lipodystrophy (intestinal) ← Cortisol
Lepore B97861/54
Perforation of sigmoid—Pathogenesis (cortisone)
Bradley B99535/54
Periadenitis mucosa necrotica recurrens ← Cortisol (locally)
Robinson B99888/54
Peritonitis ↑ ← Corticoids in blood
Bongiovanni et al C428/54 (free and conjugated)
Recto colitis ← ACTH and/or cortisone
Froelich B96829/54
Scleroderma ← ACTH and/or cortisone
Abrams et al B97877/54
Sprue ← ACTH and/or cortisone
Dubarry and Castets B98409/53 (nontropical)
Sprue Ø → 17 hydroxycorticoids in blood ← ACTH
Eik Nes et al C927/55
Sprue → Eosinophils in blood ← ACTH Ø
Becker et al B97145/54
Sprue → Eosinophils in blood ← ACTH + Pantothenic acid ↓
Becker et al B97145/54
Stomatitis ← Cortisol (locally)
Anonymous B98504/54
Subileus—Pathogenesis (liquorice)
Hennemann B98165/54
Typhoid fever ← ACTH and/or cortisone
Gros and Tilling C2149/55
Heilmeyer C72/54
Typhoid fever ← ACTH and/or cortisone + Antibiotic
Angioni C3881/54
Barreras B97283/54
Gambardella C5717/54
Keefer and Weinstein C5438/54
Woodward et al B99229/54
Typhoid fever (toxemia) ← DOCA
Barreras B97283/54
Typhoid fever → Adrenals (function) (discussion)
Camelin et al C5716/54
Typhoid fever ↓ → Histaminase in blood
Romero et al C5712/54
Typhoid fever ↓ → Ascorbic acid in blood
Chakrabarti and Banerjee C4551/55
Typhoid fever ↑ → Dehydroascorbic acid in blood
Chakrabarti and Banerjee C4551/55
Typhus fever ← Cortisone + Antibiotic
Woodward and Smadel C5439/54
Ulcerative colitis—Pathogenesis (G A S)
Nasio B99586/54
Owen and Coleman C4279/55
Ulcerative colitis ← ACTH and/or cortisone
Andrini and Visalli C5732/54
Anonymous B96846/54 (review)
Bockus B97297/54 (discussion)
Curtius and Rohrmoser C1395/55 (discussion)
Dick and Beckett B96843/54
Elliott and Giansiracusa B97859/54
Kirsner and Palmer B99894/54
Kirsner et al C6223/55
Lahey B96783/53
Messmer C5733/54
Nasio B99586/54
Powers and McKay B99533/54
ReBell B97860/54 (discussion)
Swartz B99999/54
Truelove C350/54
Truelove and Witts B96842/54
Witts C1195/55
Ulcerative colitis ← Cortisol
Kirsner and Palmer B99894/54
Kirsner et al C6223/55
Ulcerative colitis → Adrenals (hemorrhage)
Owen and Coleman C4279/55
Various gastrointestinal diseases—Pathogenesis (ANS)
Thomas C958/55

GUMS

Gums ← Various

Ionizing rays (locally) + Ascorbic acid ↓ in guinea pig
Kalnins B98018/53 (radiosensitivity)

Diseases of Gums

(For other diseases of oral cavity see Gastrointestinal diseases)

Gingivitis ← Cortisol (locally)
Horton C1492/55
Robinson B99888/54

Cortisone in rabbit
- Businco B99102/54 (histology)
- Williams and Lowe B99551/54 (ribonucleic acid acidophilic and basophilic protein lipids alkaline phosphatase)

Cortisone in rat
- Ross and Goldsmith C1648/54 (glycogen nucleic acid)
- Williams and Lowe B99551/54 (ribonucleic acid acidophilic and basophilic protein lipids alkaline phosphatase)

Cortisone ↑ in rabbit
- Bracali and Spigolon C11/54 (glycogen)
- Constantinides et al C2743/55 (weight/body weight glycogen)
- Schmid Bircher B99368/54 (weight glycogen fat)

Cortisone ↓ in rat
- Clark and Colburn C2754/55 (weight)

Cortisone ↑ in rat
- Bodansky and Money B96571/54 (weight/body weight)

Cortisone+Thyroid extract in rat
- Greenberg and Aterman C5361/55 (weight)

Cortisone+Hepatectomy (partial) in rat
- Caraffa and Pellegrini C1448/53 (weight mitosis)
- Fumagalli C1551/54 (weight histology regeneration)

Cortisone ↑+Hepatectomy (partial) in rat
- Giberti and Bianchini C2079/54 (regeneration)

Cortisone ↑+Diseases (various) in man
- Patterson et al B99900/54 (bile volume)

Cortisone+*Histoplasma capsulatum* in mouse
- Baum et al B99546/54 (histology)

Cortisone+*Schistosoma mansoni* in guinea pig
- Machado and Roche C4781/54 (histology)

Cortisone ↑+Tuberculosis in guinea pig
- Besta and Valenti B99115/52 B99119/53 (tuberculosis)

Cortisone ↑+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
- Besta et al B99116/54 (tuberculosis)

Cortisone+Carotene+Vitamin A deficiency in rat
- Clark and Colburn C2754/55 (weight)

Cortisone+CCl_4 in rat
- Rouillard and Henry B96370/53 (development of cirrhosis)

Cortisone ↓+CCl_4 in rat
- Vorhaus and Vorhaus B97869/54 (histology damage)

Cortisone ↑+CCl_4 in rat
- Vorhaus and Vorhaus B97869/54 (fatty infiltration)

Cortisone+Dye in guinea pig
- Nicol and Snell C4225/54 (RES)

Cortisone+Protein ↑ in rat
- Tremolieres et al C1924/54 (weight)

Cortisone+Fasting in rat
- Tremolieres et al C1924/54 (weight)

Cortisone ↓+Choline deficiency in rat
- Kupperman et al C1345/55 (fat)

DOCA in bird
- Kobayashi C5455/53 (weight)

DOCA in rabbit
- Binda and Possenti B93466/53 (histology)
- Yamagata et al. C5967/55 (function)

DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senile) in rat
- Korenchevsky et al. C5575/53 (weight histology)

DOCA+Folliculoids+Testoids+Thyroid extract+Age (senile) in rat
- Korenchevsky et al C5575/53 (weight histology)

DOCA+Nephrectomy (partial)+3 methylglucose ↓+NaCl (pair fed) in rat
- Skelton B97427/54 (weight)

DOCA+Hepatectomy (partial) in rat
- Caraffa and Pellegrini C1448/53 (weight mitosis)
- Fumagalli C1551/54 (weight, histology regeneration)

DOCA+Age (senile) in rat
- Korenchevsky et al C5575/53 (weight histology)

DOCA+Tuberculosis in guinea pig
- Besta and Valenti B99115/52 B99119/53 (tuberculosis)

DOCA+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
- Besta et al B99116/54 (tuberculosis)

DOCA ↓+CCl_4 in rat
- Ferrara et al C123/53 (damage)

DOCA+Potassium chloride in rat
- Hebert and Barbarin C3371/54 (histology lipids esterase)

Ovariectomy+Testoids+Carcinogen in rat
- Firminger and Morris C5302/55 (cirrhosis)

Ovarian extract, in rabbit
- Yamagata et al C5967/55 (function)

ACTH + Casein + Potassium chloride + *Protein deficiency in rat*
Aschkenasy and Dray C1990/54 C1991/53 (weight)

ACTH + Potassium chloride + *Protein* deficiency in rat
Aschkenasy and Dray B99606/54 (weight)

STH ↑ in dog
Campbell B99964/53 (weight/body weight)

STH Ø in guinea pig
Lanzza et al B99367/53 (histology)

STH ↑ in mouse
Mirand and *Hoffman C1396/55* (weight)

STH in rat
Mattem and Marabini B99837/53 (weight)

STH ↑ in rat
Matteini and Giusti B98288/53 (weight)
Sforzini C3109/54 (fat)

STH + Alloxan in rat
Malandra et al C3085/53 (weight)

STH + Hepatectomy (partial) in rat
Ciraffa and Pellegrini C1448/53 (*weight mitosis*)

STH + Tuberculosis + Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)

STH Ø + Ionizing rays in rat
Sellers and Barlow B98893/54 (weight/body weight)

STH + Casein + Protein deficiency in rat
Aschkenasy C1990/54 C1991/53 (weight)

STH + Protein deficiency in rat
Aschkenasy and Dray B99606/54 (*weight*)

GTH in rabbit
Yamagata et al C5967/55 (function)

Hypophyseal posterior lobe extract in rabbit
Yamagata et al C5967/55 (function)

Adrenalectomy + Cortisone in rat
Fraile C4666/53 (weight)

Adrenalectomy + Cortisone + Testis extirpation in rat
Tremolieres et al C1924/54 (weight)

Adrenalectomy + Cortisone + Hepatectomy (partial) in rat
Fumagalli C1551/54 (weight histology regeneration)

Adrenalectomy + Cortisone + Carotene + Vitamin A deficiency in rat
Clark and Colburn C2754/55 (weight)

Adrenalectomy + Cortisol + DOCA + Diet in rat
Ventura C5857/55 (weight)

Adrenalectomy + Cortisol + DOCA + Starvation in rat
Ventura and Selye C1531/55 (weight)

Adrenalectomy + DOCA ↓ + Nephrectomy (partial) + NaCl in rat
Gross et al B99957/55 (glycogen)

Adrenalectomy + DOCA + Hepatectomy (partial) in rat
Fumagalli C1551/54 (weight *histology* regeneration)

Adrenalectomy + DOCA + *Serum* in rat
Scheiffarth and Berg B99788/53 (histology)

Adrenalectomy + DOCA + Diet in rat
Ventura C5857/55 (weight)

Adrenalectomy + Aldosterone ↓ + Nephrectomy (partial) + NaCl in rat
Gross et al B99957/55 (glycogen)

Adrenalectomy + Alloxan in rabbit
Nagahama B96563/53 (fatty degeneration glycogen)

Adrenalectomy ↓ + Hepatectomy (partial) in rat
Fumagalli C1551/54 (weight histology regeneration)

Adrenalectomy + Serum in rat
Scheiffarth and Berg B99788/53 (*histology*)

Adrenalectomy + Starvation in rat
Ventura and Selye C1531/55 (weight)

Adrenal transplant in rabbit
Binda and Possenti B93466/53 (*histology*)

Adrenaline ↓ in rabbit
Archdeacon et al. B99001/54 (*bile flow*)

Adrenaline + Insulin in rat
Ono B96663/53 (histology)

Adrenaline + Histamine in rat
Ono B99328/51 (histology)

Adrenaline + Pilocarpin in rat
Ono B96662/53 (histology)

Adrenaline + Vitamin B_1 in rat
Fekete and Prokai C3200/54 (*weight*)

ACE in rabbit
Yamagata et al C5967/55 (function)

ACE + Choline deficiency in rat
Kupperman et al C1345/55 (*fat*)

Cortisone in guinea pig
Businco B99102/54 (histology)

Cortisone in mouse
Williams and Lowe B99551/54 (ribonucleic acid acidophilic and basophilic protein lipids alkaline phosphatase)

Cortisone in rabbit
Businco B99102/54 (histology)
Williams and Lowe B99551/54 (ribonucleic acid acidophilic and basophilic protein lipids alkaline phosphatase)
Cortisone in rat
Ross and Goldsmith C1648/54 (glycogen nucleic acid)
Williams and Lowe B99551/54 (ribonucleic acid acidophilic and basophilic protein lipids alkaline phosphatase)
Cortisone ↑ in rabbit
Bracali and Spigolon C11/54 (glycogen)
Constantinides et al C2743/55 (weight/body weight glycogen)
Schmid Bircher B99368/54 (weight, glycogen fat)
Cortisone ↓ in rat
Clark and Colburn C2754/55 (weight)
Cortisone ↑ in rat
Bodansky and Money B96571/54 (weight/body weight)
Cortisone+Thyroid extract in rat
Greenberg and Aterman C5361/55 (weight)
Cortisone+Hepatectomy (partial) in rat
Caraffa and Pellegrini C1448/53 (weight, mitosis)
Fumagalli C1551/54 (weight histology regeneration)
Cortisone ↑+Hepatectomy (partial) in rat
Giberti and Bianchini C2079/54 (regeneration)
Cortisone ↑+Diseases (various) in man
Patterson et al B99900/54 (bile volume)
Cortisone+*Histoplasma capsulatum* in mouse
Baum et al B99546/54 (histology)
Cortisone+*Schistosoma mansoni* in guinea pig
Machado and Roche C4781/54 (histology)
Cortisone ↑+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (tuberculosis)
Cortisone ↑+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al B99116/54 (tuberculosis)
Cortisone+Carotene+Vitamin A deficiency in rat
Clark and Colburn C2754/55 (weight)
Cortisone+CCl_4 in rat
Rouillard and Henry B96370/53 (development of cirrhosis)
Cortisone ↓+CCl_4 in rat
Vorhaus and Vorhaus B97869/54 (histolo v damage)
Cortisone ↑+CCl_4 in rat
Vorhaus and Vorhaus B97869/54 (fatty infiltration)
Cortisone+Dye in guinea pig
Nicol and Snell C1225/54 (RES)
Cortisone+Protein ↑ in rat
Tremolieres et al C1924/54 (weight)
Cortisone+Fasting in rat
Tremolieres et al C1924/54 (weight)
Cortisone ↓+Choline deficiency in rat
Kupperman et al C1345/55 (fat)
DOCA in bird
Kobayashi C5455/53 (weight)
DOCA in rabbit
Bindi and Po senti B93466/53 (histology)
Yamagata et al. C5967/55 (function)
DOCA+Folliculoids+Testis extirpation+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight histology)
DOCA+Folliculoids+Testoids+Thyroid extract+Age (senile) in rat
Korenchevsky et al C5575/53 (weight histology)
DOCA+Nephrectomy (partial)+3-methylglucose ↓+NaCl (pair fed) in rat
Skelton B97427/54 (weight)
DOCA+Hepatectomy (partial) in rat
Caraffa and Pellegrini C1448/53 (weight, mitosis)
Fumagalli C1551/54 (weight histology regeneration)
DOCA+Age (senile) in rat
Korenchevsky et al C5575/53 (weight histology)
DOCA+Tuberculosis in guinea pig
Besta and Valenti B99115/52 B99119/53 (tuberculosis)
DOCA+Tuberculosis+Isonicotinic acid hydrazide in guinea pig
Besta et al. B99116/54 (tuberculosis)
DOCA ↓+CCl_4 in rat
Ferrara et al C123/53 (damage)
DOCA+Potassium chloride in rat
Hebert and Barbarin C3371/54 (histology lipids esterase)
Ovariectomy+Testoids+Carcinogen in rat
Firminger and Morris C5302/55 (cirrhosis)
Ovarian extract, in rabbit
Yamagata et al. C5967/55 (function)

Folliculoids in rabbit
Yamagata et al C5967/55
(function)
Folliculoids + Testis extirpation + Carcinogen in rat
Firminger and Morris C5302/53
(cirrhosis)
Folliculoids + Testoids + Thyroxin + Age (immature) in fowl
Common et al C6772/55 (weight)
Folliculoids + Hepatectomy (partial) in rat
Ciraffa and Pellegrini C1448/53
(weight mitosis)
Folliculoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Luteoids in rabbit
Yamagata et al C5967/55 (function)
Testoids in rabbit
Yamagata et al C5967/55 (function)
Testoids + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Thiourea ↑ + Protein in rat
Aragona and Barone C2401/53
(sclerosis)
Thyroxin in rabbit
Yamagata et al C5967/55 (function)
Thyroxin + Casein + Protein deficiency in rat
Aschkenasy and Dray C1990/54
C1991/53 (weight)
Parathyroid hormone ↑ + Tuberculosis in guinea pig
Schafer B99214/54 (necrosis)
Alloxan ↓ in rabbit
Nagahama B96563/53 (glycogen)
Alloxan ↑ in rabbit
Nagahama B96563/53
(fatty degeneration)
Pancreas extract (padutin) in rabbit
Yamagata et al C5967/55
(function)
Insulin in rabbit
Yamagata et al C5967/55
(function)
Insulin + ABA (atropine) in rat
Ono B9663/53 (histology)
Glucagon ↑ in rat
Cavallero et al C2038/53 (weight)
Thymus extract ↓ in rat
Matteini and Marabini B99837/53
(weight)
Splenectomy ↑ + Protein, in rat
Aragona and Barone C2401/53
(sclerosis)
Lymph node extract in rat
Matteini and Marabini B99837/53
(weight)

Nephrectomy ↓ + Aorta irritation (croton oil subadventitially) in dog guinea pig and rabbit
Benelli et al B99142/53 (lesions)
Hepactectomy (partial) + Cold ↑ in rat
Moss and Weiss C5126/53
(regeneration)
Liver extract in rat
Matteini and Marabini B99837/53
(weight)

Liver ← Stressors

Trauma + Burns + Protein Ø in rat
Calloway et al B99085/54 (weight)
Aorta irritation (croton oil subadventitially) in dog guinea pig and rabbit
Benelli et al. B99142/53 (lesions)
Aorta irritation (croton oil subadventitially) + ABA (promethazine) ↓ in dog, guinea pig and rabbit
Benelli et al B99142/53 (lesions)
Cold
Aujard B99790/53 (histology)
Cold ↓ in rat
Archdeacon et al B99001/54
(bile flow)
Ionizing rays in rat
Chevallier et al. B97952/53
(fatty degeneration)
Ionizing rays + Thorotrast in rat
Gabrieli and Auskaps B99152/53
(RES)
Ultrasound in guinea pig
Introna C4806/53 (histology)
Muscular exercise + Starvation in man
Taylor et al C1673/54 (function)
Hypoxia ↓ in rabbit
Archdeacon et al. B99001/54
(bile flow)
ABA (various)
Yamagata et al B97617/53
(RES function)
ABA (various) in man
Ciocatto et al B99166/53 (function)
Ascorbic acid in rabbit
Yamagata et al C5967/55 (function)
Diethyl methanephosphonate
Aujard B99790/53 (histology)
Egg white (i p) in rat
Scheiffarth and Berg B99788/53
(histology)
Heparin ↑ in rabbit
de Matteis B97350/54 (weight)
Isonicotinic acid hydrazide ↓ in rat
Arezio and Bidone C2024/53
(glycogen)
Peptone in dog
Baeckeland and Lecomte C519/53
(mastocytes)
Starvation ↑ in rat
DaCosta et al B99086/54
(weight/body weight)

Starvation ↓ in rat
Harrison B99773/53 (weight)
Ventura and Selye C1531/55 (weight)
Starvation + Refeeding in rat
DaCosta et al B99086/54 (weight/body weight)
Choline deficiency ↑ in rat
Kupperman et al C1345/55 (fat)

Hepatic Diseases

Cirrhosis (portal) → Amino acid in blood urine ← STH + Amino acid
Elrick C5911/55
Cirrhosis (portal) → Glucose (arteriovenous difference in blood) ← STH + Glucose
Elrick C5911/55
Hepatic cirrhosis—Pathogenesis
Hartfall B98133/54 (ACTH and/or cortisone)
Vague C2958/54 (adrenals gonads)
Hepatic cirrhosis ← ACTH and/or cortisone
Anonymous B97296/54 (discussion)
Cattan et al B99239/54 (posticteric)
Hetenyi B95832/54 (discussion)
Kumpe B97867/54
Zoeckler B97866/54
Hepatic cirrhosis ← STH
Bernard C4696/54
Hepatic cirrhosis (with ascites) ← Adrenalectomy + Cortisone + Na deficiency
Marson B99205/54
Hepatic cirrhosis → Glucose in urine ← STH ↑
Bernard C4696/54
Hepatic cirrhosis → Amino acid in urine ← ACTH Ø
Walshe B96474/53
Hepatic cirrhosis → Albumin/globulin ratio in blood ← Cortisone
Zoeckler B97866/54
Hepatic cirrhosis → Diuresis ← STH ↑
Bernard C2937/54
Hepatic cirrhosis → Corticoids in blood
Klein et al C1819/55 (free and conjugated)
Peterson and Wyngaarden C4077/55 (cortisol radioactive)
Hepatic cirrhosis Ø → 17 hydroxycorticoids in blood
Brown et al B99415/54
Tyler and Samuels C3459/54
Hepatic cirrhosis → 17 hydroxycorticoids in blood ← ACTH
Brown et al B99415/54
Tyler and Samuels C3459/54
Hepatic cirrhosis → Corticoids in blood ← Cortisone
Bongiovanni et al C428/54 (free and conjugated in blood)
Hepatic cirrhosis Ø → 17 hydroxycorticoids in blood ← Tetrahydrocortisone
Brown et al B99415/54
Hepatic cirrhosis ↑ → 17 hydroxycorticoids in blood ← Cortisol
Brown et al B99415/54
Hepatic cirrhosis → Corticoids in urine
Bruckel et al C1222/54 (17 hydroxycorticoids)
Schedl et al B97475/53
B96475/53 (Δ ketocorticoids)
Warter et al B97743/53
Hepatic cirrhosis → 17 hydroxycorticoids in urine ← Dihydrocortisone tetrahydrocortisone
Brown and Englert C4048/55 (free and conjugated)
Hepatic cirrhosis → 17 hydroxycorticoids in urine ← Cortisol
Brown and Englert C4048/55 (free and conjugated)
Brown et al B99415/54 (free and conjugated)
Hepatic cirrhosis → 17 hydroxycorticoids in urine ← Tetrahydrocortisol
Brown and Englert C4049/55 (free and conjugated)
Hepatic cirrhosis ↑ → Aldosterone in urine
Axelrad et al C6372/55 (when urinary sodium was low)
Luetscher and Johnson B99409/54
Hepatic cirrhosis → 17 KS in urine (fractions)
Cameron B98966/54
Hepatic cirrhosis ↓ → 17 KS in urine
Bruckel et al C1222/54
Warter et al B97743/53
Hepatic cirrhosis → 17 KS in urine ← Drugs (mercurial diuretic) ↑
Vallecorsi and Checchia C_941/53
Hepatic cirrhosis ← Etiocholane 3 11β diol 17 one
Plantin and Birke C5684/55
Hepatic cirrhosis → Histamine in blood ← Cortisone ↓
Mitchell et al B99550/54
Hepatic cirrhosis → Histamine in urine ← Cortisone ↑
Mitchell et al B99550/54
Hepatic cirrhosis → Eosinophils in blood ← ACTH Ø adrenaline Ø cortisone ↓
Cortes B97746/53
Hepatic cirrhosis → Erythrocyte destruction (after transfusion) ← Cortisone Ø + Anemia
Jandl C_852/55

Hepatic coma ← ACTH and/or cortisone
Alexander and Porter B97865/51
Carpenter and Bell B99901/54
Cauchie C3553/55
Coleman et al B99902/51
Heilmeyer C72/54
Kalk C3699/55 (discussion)
Inechini and Apablaza C1265/53
Sanz Hernandez B97298/54
(discussion)
Hepatic coma ← DOCA
Kalk C3699/55 (*discussion*)
Hepatitis ← ACTH and/or cortisone
Bastenie C3552/55
Bertrand B97709/53 (discussion)
Conillera B99508/54 (discussion)
Girard B99938/54 (discussion)
Goulston B97708/53
Heilmeyer C72/54
Heilmeyer et al C6415/55 (virus)
Lanthier and Grignon B99419/54
Roskam and van Cauwenberge
B96770/53 (icterus gravis)
Vachon et al C4685/54
Hepatitis ← ACTH and/or cortisone+
Antibiotic
Jahn et al B98515/54
(virus review)
Kinsell C6525/55 (virus)
Hepatitis ← Corticoids (discussion)
Schneiderbaur B96767/53
(infectious)
Hepatitis ← Cortisol+Antibiotic
Jahn et al B98515/54
(virus review)
Hepatitis ← DOCA
Benda et al C2914/54 (virus)
Heinemann C1223/54
Hepatitis ← Hibernation (artificial)+
Seasickness
Billiottet and Fuchs B97701/53
(cirrhotic)
Hepatitis → Na/potassium ratio in urine
← DOCA
Benda et al C2914/54 (virus)
Hepatitis → Diuresis ← STH ↑
Bernard C2937/54 (alcoholic)
Hepatitis Ø → 17 hydroxycorticoids
in blood
Brown et al B99415/54
Tyler and Samuels C3459/54
Hepatitis → 17 hydroxycorticoids in blood
← *ACTH*
Tyler and Samuels C3459/54
Hepatitis ↑ → 17 hydroxycorticoids
in blood ← Cortisol
Brown et al B99415/54
Hepatitis ↑ → Corticoids in urine
(reducing)
Candiani et al C2304 (virus)
Hepatitis → 17 *hydroxycorticoids* in urine
Bruckel et al C1222/54

Hepatitis → 17 KS in urine
Bruckel et al C1222/54
Candiani et al C2304/54 (virus)
Hepatitis → 17 KS in urine ← ACTH
Eymer and Moll B99232/54
Hepatitis → Eosinophils in blood
Villasenor et al B96764/53 (virus)
Hepatitis → Eosinophils in blood ←
ACTH ↓
Cortes B97746/53 (virus)
Eymer and Moll B99232/54
Hepatitis → Eosinophils in blood ←
Adrenaline ↓
Cortes B97746/53 (virus)
Hepatitis → Erythrocyte resistance
(osmotic) ← ACTH
Ringelmann and Toth C2142/54
Hepatitis → Kidney ← DOCA
Benda et al C1010/53 (function)
Icterus–Pathogenesis
Almeiden and Ross B99240/54
(methyltestosterone)
Loftus et al C3614/55
(chlorpromazine)
Icterus ← ACTH and/or cortisone
Langeron C2913/54
(icterus gravis)
van Ommen and Brown C1180/55
(chlorpromazine)
Vachon et al C6020/55 (infectious)
Icterus (Weil) → Thyroid (histology)
Kracht C1125/54
Phosphorus poisoning ← Cortisone
Andersson and Cranath B99317/54
Francke et al B99316/54
Porphyria hepatica ← ACTH and/or
Cortisone
Olson and Stiles C5743/54
B99904/54
Steatosis–Pathogenesis (STH thyroxin
deficiency)
Giraud et al B98096/53
Various hepatic diseases →
Vasopressin in body fluids
Scavo C4950/54 (discussion)
Various hepatic diseases →
17 hydroxycorticoids in blood ←
Cortisol+Stress
Weichselbaum et al C5216/55
Various hepatic diseases (chronic) →
F Cs in urine ← Trauma ↑
Conn C1134/54
Various hepatic diseases ↓ → *17 KS*
in urine
Franckson et al B97745/53
Various hepatic diseases (chronic) →
17 KS in urine ← Trauma Ø
Conn C1134/54
Various hepatic diseases → Adrenals
(function)
Franckson et al B97745/53
(discussion)

Various hepatic diseases → Eosinophils in blood ← ACTH
Boehi C3909/54
Various hepatic diseases → Blood pressure ← ACTH
Boehi C3909/54
Wilson's disease ← ACTH
Zimdahl et al B97868/54
Wilson's disease → Copper balance ← ACTH
Zimdahl et al B97868/54

GROWTH AND BONES

(For other pertinent data cf also AROS 1951 pp 234-239 AROS 1952 pp 169-171 AROS 1953 pp 222-224 AROS 1954 pp 411-412 and Body weight in chapter General metabolism)

Generalities
Anonymous B98223/54 (skeletal growth and maturation—discussion)
Ernould C3381/54 (growth—review)
McLean and Urist C1734/55 (review)

Growth and Bones ← Stimuli

Hypophysectomy ↓ in rat
Tobias et al B97093/54 (tail growth)
Hypophysectomy ↑ in rat
Gordamch and Montanari B98338/53 (aging)
Hypophysectomy + ACTH ↓ + STH in rat
Li C894/53 (width of cartilage in tibia test)
Hypophysectomy + ACTH + STH + Thyroxin ↑ in rat
Li C894/53 (width of cartilage in tibia test)
Hypophysectomy + STH in fish
Pickford B97426/54
Hypophysectomy + STH in rat
Asling et al C1369/54
Barbour and Cook C2622/54 (electron microscopic study)
Mitchell et al B99023/54 (growth–tibia test)
Hypophysectomy + STH (long term) in rat
Asling et al C4259/55 (tibia body length bone)
Hypophysectomy + STH + Adrenalectomy + DOC in rat
Geschwind and Li C4234/55 (epiphyseal cartilage)
Hypophysectomy + STH + Thyroidectomy ↓ in rat
Li C894/53 (width of cartilage in tibia test)
Hypophysectomy + STH + Thyroidectomy + Thyroxin in rat
Ray et al C3114/54
Hypophysectomy + STH + Thyroxin in rat
Asling et al C5910/54 (bone tibia test)
Hypophysectomy + STH + Thyroxin ↑ in rat
Li C894/53 (width of cartilage in tibia test)
Hypophysectomy + STH Ø + Age (immature) in guinea pig
Segaloff C4966/55 (tibia test)
Hypophysectomy + STH + Folic acid vitamin B_1 in rat
Penhos and Foglia C6716/54
Hypophysectomy + DOC in rat
Geschwind and Li C4234/55 (tibia test)
Hypophysectomy + Thyroxin in rat
Asling et al C5910/54 (bone tibia test)
Hypophysectomy + Thyroxin ↑ in rat
Scow B97452/54 (growth in length)
Hypophysectomy + Insulin in rat
Geschwind and Li C4234/55 (tibia test)
Hypophysectomy + Insulin ↑ in rat
Best C4973/55 (growth)
Hypophysectomy + Glucagon Ø in rat
Mitchell et al B99023/54 (growth–tibia test)
Hypophysectomy + Nephrectomy (partial) + ERH (cellophane wrapping) in rat
Eger B98259/53 (histology)
Hypophysectomy + Antibiotic in rat
Geschwind and Li C4234/55 (tibia test)
Hypophysis irradiation (deuterons) ↓ in rat
Tobias et al B97093/54 (tail growth)
Hypophyseal transplant ↑ in man
Mukai B96754/50 (growth)
ACTH
Layani and Durupt B99501/54 (review)
McLean and Urist C1734/55 (discussion)
ACTH in man
Anonymous C6377/55
Curtiss et al B98232/54 (vertebral fractures)
C1384/54 (appearance of fractures)

ACTH Ø *in salamander*
Bragdon and Dent C429/54
(limb regeneration after amputation)
ACTH + STH in rat
Geschwind and Li C4234/55
(epiphyseal cartilage)
STH
Layani and Durupt B99301/54
(review)
McLean and Urist C1734/55
(discussion)
STH in man
Shorr et al C4258/55 (growth)
STH *in rat*
Asling et al C1369/54
Barbour and Cook C2622/54
(electron microscopic study)
STH (long term) in rat
Asling et al C1239/55
(tibia body length bone)
STH + LTH TTH in rat
Geschwind and Li C4234/55
(tibia test epiphyseal cartilage)
STH + Adrenalectomy + Cortisol + DOCA ↑
Selye and Bois C1718/55
(growth of epiphyseal cartilage)
STH + Adrenalectomy + DOCA ↑ + Ovariectomy in rat
Selye and Bois C1718/55
(growth of epiphyseal cartilage)
STH + Adrenalectomy + Aldosterone ↑ + Ovariectomy in rat
Selye and Bois C1718/55
(growth of epiphyseal cartilage)
STH + Folliculoids in rat
Conti B98675/54
(histology tibia test)
Geschwind and Li C4234/55
(tibia test)
STH + Testoids thyroxin in rat
Geschwind and Li C4234/55
(tibia test epiphyseal cartilage)
STH + Age (embryonic) in fowl
Blumenthal et al C2433/54
(epiphyseal cartilage periosteum of tibias tibia)
Fell C4238/55 (in vitro)
STH + Calcium deficiency + Magnesium deficiency + Potassium deficiency in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
STH + Cl deficiency Na deficiency NaCl deficiency in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
TTH
Layani and Durupt B99301/54
(review)
LTH + Testoids in rat
Geschwind and Li C4234/55
(tibia test)

Adrenalectomy ↑ in rat
Buffett and Wyman C2461/55
(width of epiphyseal cartilage)
Adrenalectomy + Ovariectomy in man
Forsham C5419/55 (osteoporosis)
Adrenalectomy + Ovariectomy in rat
Buffett and Wyman C2461/55
(width of epiphyseal cartilage)
Layani and Chrouat C1277/54
Adrenalectomy + Testis extirpation in rat
Buffett and Wyman C2461/55
(width of epiphyseal cartilage)
Cortisone
Anonymous C6377/55
McLean and Urist C1734/55
(discussion)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↑ in hamster
Toolan B96597/54 (growth of human embryonic cartilage transplant)
Cortisone in man
Curtiss et al B98232/54
(vertebral fractures)
C1384/54
(appearance of fractures)
Cortisone in rabbit
Businco B99102/54 (histology)
Schmid Bircher B99368/54
(histology)
Sissons and Hadfield C3623/55
(growth bones)
Cortisone in rat
Sissons and Hadfield C3623/55
(growth bones)
Cortisone ↓ in rat
Boas and Scow B96567/54
(growth of skull)
Cortisone Ø in salamander
Bragdon and Dent C429/54
(limb regeneration after amputation)
Cortisone ↓ + Folliculoids in mouse
Martin and Majno B99908/54
(osteogenesis)
Cortisone ↑ + Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)
Cortisone + Ionizing rays in rat
Toolan B96597/54 (growth of *human embryonic cartilage* transplant)
Cortisol in *Drosophila*
Schultz et al C3603/55 (growth)
Cortisol in rat
Geschwind and Li C4234/55
(epiphyseal cartilage)
Cortisol + Thiourea Ø + Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)

Cortisol ↑+Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)
Cortisol+Age (embryonic) in fowl
Karnofsky C3602/55 (growth)
Cortisol+Age (embryonic) in frog
Bieber and Hitchings C3601/55
(growth)
DOCA Ø+Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)
DOCA+Age in toad
Kobayashi and Okubo C5441/54
(metamorphosis)
Sex+Antibiotic fish solubles in rat
Dickson et al C3982/54
(growth tail length)
Ovariectomy ↑ in rat
Buffett and Wyman C2461/55
(width of epiphyseal cartilage)
Ovariectomy+Folliculoids (locally)
in mouse
Crelin and Haines C3568/55
(symphysis knee)
Ovariectomy+Age in rat
Geschwind and Li C4234/55
(epiphyseal cartilage)
Ovariectomy+Antibiotic fish solubles
in rat
Dickson et al C3982/54
(growth tail length)
Folliculoids in *Drosophila*
Schultz et al C3603/55 (growth)
Folliculoids in rat
Geschwind and Li C4234/55
(tibia test)
Folliculoids (locally)+Testis extirpation
in mouse
Crelin and Haines C3568/55
(symphysis knee)
Folliculoids ↑+Thyroxin, in tadpole
Frieden and Naile C719/55
(metamorphosis)
Folliculoids+Age (embryonic) in fowl
Karnofsky C3602/55 (growth)
Folliculoids+Age (embryonic) in frog
Bieber and Hitchings C3601/55
(growth)
Folliculoids+Age (childhood) in man
Gargollo C39[illegible]8/54
Folliculoids+Calcium deficiency+
Magnesium deficiency+Potassium
deficiency in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
Folliculoids+Cl deficiency Na deficiency
NaCl deficiency in axolotl
Brocq and Roth C3368/54
(growth *metamorphosis*)
Luteoids+Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)

Testis extirpation in rat
Buffet and Wyman C2461/55
(width of epiphyseal cartilage)
Testis extirpation+Antibiotic fish solubles
in rat
Dickson et al C3982/54
(growth tail length)
Testoids in rat
Geschwind and Li C4234/55
(tibia test)
Testoids ↓+Thyroxin in tadpole
Frieden and Naile C719/55
(metamorphosis)
Testoids+Calcium deficiency+
Magnesium deficiency+Potassium
deficiency in axolotl
Brocq and Roth C3368/54
(growth, metamorphosis)
Testoids+Cl deficiency Na deficiency
NaCl deficiency in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
MAD+Age (childhood) in man
Posterado and Rinaldi C3540/54
(growth)
Thyroidectomy ↓ in rat
Boas and Scow B96567/54
(growth of skull)
Thyroxin+Age (embryonal) in fowl
Fell C4238/55 (in vitro)
Thyroxin+Ascorbic acid ↑ salicylate ↑
in tadpole
Frieden and Naile C719/55
(metamorphosis)
Thyroxin+Calcium deficiency+Magnesium
deficiency+Potassium deficiency
in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
Thyroxin+Cl deficiency Na deficiency
NaCl deficiency in axolotl
Brocq and Roth C3368/54
(growth metamorphosis)
Insulin+Age (embryonal) in fowl
Fell C4238/55 (in vitro)
Glucagon+Age (embryonal) in fowl
Fell C4238/55 (in vitro)
Age in rat
Barbour and Cook C2622/54
(electron microscopic study)

Growth and Bones ← Stressors

Cold ↑ in frog
Sforzini C3212/53 (metamorphosis)
Phosphorus deficiency in rat
Barbour and Cook C2622/54
(electron microscopic study)

Diseases of Bones

Achondroplasia → Bones growth ←
Methyltestosterone
Hellinga C4466/55

Bone infections–Pathogenesis (G A S)
Wanke B96948/53
Coxitis → Kidney ← ACTH
Lyam and Sichere C2954/54
Eosinophilic granuloma of skull ←
ACTH and/or cortisone
Flosi et al C2308/54
Epiphyseolysis femoris–Pathogenesis
Ehrengut C4170/54
(internal secretion of STH steroids)
Hyperostosis (infantile cortical) ←
Cortisone
Sidbury and Sidbury B98523/54
(discussion)
Hyperostosis (Morgagni s syndrome) →
Corticoids 17 KS in urine
van Cauwenberge C1976/54
Hyperostosis (Morgagni s syndrome) →
Hypophysis (histology)
Baruffaldi and Bonifaci C2034/53
Hyperostosis (Morgagni s syndrome) ↑ →
Adrenals (weight)
Baruffaldi and Bonifaci C2034/53
Osteitis pubis ← Cortisone
Hoffman and Erhard B98525/54
Osteoporosis–Pathogenesis
Anonymous C6377/55
(ACTH cortisone)
Cooke C4939/55 (hypophysis
adrenals gonads thyroid)
Copeman C3857/53 (adrenals)
Eisenstadt and Cohen C6631/55
(ACTH and/or cortisone)
Fourman C3691/55
(adrenals nonspecific)
Nordin and Roper C2823/55
(pregnancy adrenals)
Richards B98841/54
(ACTH and/or cortisone)
Osteopetrosis ← ACTH
Turano et al B99905/54
Pachyperiostosis–Pathogenesis
(hypophysis)
Parsons and Cody B99873/53
Sudeck s syndrome–Pathogenesis
(G A S)
Blumensaat C5447/55

JOINTS

Joints ← Stimuli

Hypophysectomy Ø in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Hypophysectomy + ACTH ↓ in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Hypophysectomy + STH in rat
Asling *et al* C1369/54 C4239/55
Selye and Salgado C4970/55
Simpson C4971/55
Hypophysectomy + Cortisone ↓ in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Hypophysectomy + DOCA in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
ACTH ↓ in rabbit
Seifter and Baeder C444/54
(synovial membrane permeability)
ACTH Ø + Adrenalectomy in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
STH in rat
Asling et al C1369/54 C4239/55
STH + Thyroidectomy + Nephrectomy
(partial) + NaCl in rat
Salgado B98385/54
(appearance of arthritis)
Adrenalectomy + Cortisone ↑ in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Adrenalectomy + DOCA in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Adrenalectomy + Allopregnane-21 ol 3 20
dione 21 acetate in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Adrenalectomy + 21 acetoxypregnenolone ↑
in rabbit
Baeder and Seifter C426/54
(synovial membrane permeability)
Cortisone in guinea pig
Jones and Carter C5899/54
Cortisone in rabbit
Cresseri and Meli C523/53
(synovial membrane permeability)
Seifter and Baeder C444/54
(synovial membrane permeability)
Cortisol (locally) in man
Strach C5379/55
(suppurative arthritis)
DOCA in rabbit
Seifter and Baeder C444/54
(synovial membrane permeability)
Thyroidectomy (radioiodine) in mouse
Silberberg and Silberberg C5543/54
Thyroidectomy (radioiodine) ↑ + Heredity
in mouse
Silberberg and Silberberg B99007/54
(development of joint disease)

Joints ← Stressors

Bacterial toxin in guinea pig
Jones and Carter C5899/54
Bacteria + Polysaccharides in rabbit
Glynn and Holborow C5033/52
(arthritis)
Nerves (emotions) in mouse
Scott C5464/55 (spinal column)
Benzoylcarbinol derivatives in rabbit
Cresseri and Meli C523/53
(synovial membrane permeabilty)

Histamine in guinea pig
Jones and Carter C5899/54
Methyldiphenylcarbometoxyketo-
propanediol in rabbit
Cresseri and Meli C523/53
(synovial membrane permeability)
Polysaccharides in guinea pig
Jones and Carter C5899/54
Jones et al. C5900/54
Trypsin in guinea pig
Jones and Carter C5899/54
Ascorbic acid deficiency in guinea pig
Aterman B96732/54 (swelling)
Jones and Carter C5899/54

Topical Irritation Arthritis (TIA)

[The subject of study and the causative *agent are indicated in brackets e g* TIA (formalin) means topical irritation arthritis elicited by the injection of formalin into the joint region]

Generalities
Bocking and Brien C6882/55
(blood formalin in rabbit)
Wilhelmi and Pulver C4787/55
(formalin+phenylbutazone
irgapyrin antipyrin in rat)

TIA ← Stimuli

Denervation ↓ in rat
Trnavsky et al C6478/55
(hyaluronidase)
Hypophysectomy ↓ in rat
Hillebrecht B99128/54 (kaolin)
Kelemen et al C4186/55
(hyaluronidase)
Hypophysectomy+ACTH+STH+
Nephrectomy (partial)+NaCl
in rat
Salgado C1002/54 (dextran)
Hypophyseal anterior lobe extract ↓
in rat
Trnavsky et al C6478/55
(hyaluronidase)
ACTH in rat
Hillebrecht B99128/54 (egg white)
Morsdorf et al C6679/55
(formalin)
ACTH ↓ in rat
Hillebrecht B99128/54 (kaolin)
(STH+DOCA) ↑ in rat
Hillebrecht B99128/54 (kaolin)
CTH ↓ in rat
Trnavsky et al C6478/55
(hyaluronidase)
Adrenalectomy+Cortisol+DOCA ↑
aldosterone ↑ in rat
Jasmin C1452/55 (dextran)
Adrenalectomy+NaCl+Trypsin in rat
Adamkiewicz et al C4965/55
(yeast egg white kaolin)
Adrenalectomy+Trypsin ↓ in rat
Adamkiewicz et al B98861/54
(egg white yeast filtrates)
C4965/55 (egg white)
Cortisone in guinea pig
French et al C5972/55
(reverse Arthus reaction)
Cortisone in rat
Hillebrecht B99128/54 (egg white)
Cortisone ↓ in rat
Adamkiewicz et al B98861/54
(kaolin—acute chronic phase)
Hillebrecht B99128/54 (kaolin)
Kelemen et al C4186/55
(hyaluronidase)
Morsdorf et al C6679/55
(formalin)
Cortisone+Trypsin in rat
Adamkiewicz et al C4965/55
(yeast, egg white kaolin)
DOCA Ø in rat
Hillebracht B99128/54 (kaolin)
Trnavsky et al C6478/55
(hyaluronidase)
Testoids Ø in rat
Trnavsky et al C6478/55
(hyaluronidase)
Hepatectomy (partial) ↑ in rat
Blech and Emmrich B98111/54
(formalin)
Hepatectomy (partial)+Choline Ø
in rat
Blech and Emmrich B98111/54
(formalin)
Aging ↓ in rat
Kelemen et al C4186/55
(hyaluronidase)

TIA ← Stressors

Serologic reactions in rabbits
Bocking and Brien C6822/55
(egg albumin tuberculin)
ABA (antihistamine atropine
dibenamine ergot derivative)
in rat
Trnavsky et al C6478/55
(hyaluronidase)
N Alkyl piperidyl benzhydrylaether
in rat
Nieschulz and Scheuermann
C4784/55 (egg white)
Amidopyrine ↓ in rat
Trnavsky et al C6478/55
(hyaluronidase)
Anesthetic (chloral hydrate) Ø in rat
Trnavsky et al. C6478/55
(hyaluronidase)
Anesthetic (procaine block) in rat
Trnavsky et al C6478/55
(hyaluronidase)
Beryllium ↓ in rat
Bludau and Heite C255/54
(egg white)

Calcium salts ↓ in rat
Bludau and Heite C255/54
(egg white)
Chymotrypsin ↓ in rat
Martin et al B98149/54
(egg white)
Cumarine in rat
Trnavsky et al C6478/55
(hyaluronidase)
Cysteinamine ↓ in rat
Morsdorf et al C6679/55
(formalin)
Cystinamine ↓ in rat
Morsdorf et al C6679/55
(formalin)
Dextrin (i p)+Phenergan ↓ in rat
Halpern C5661/54 (dextrin)
Egg yolk ↓ in guinea pig
Coburn et al C6269/54
(Arthus phenomenon)
Fibrinolysin ↓ in rat
Martin et al B98149/54
(egg white)
Heparin ↓ in rat
Trnavsky et al C6478/55
(hyaluronidase)
Hesperidin ↓ in rat
Martin et al C521/53
(egg white)
Hyaluronidase ↑ in rat
Stepantschitz and Kresbach
B98651/54 (formalin)
Irgapyrine ↓ in rat
Trnavsky et al C6478/55
(hyaluronidase)
Magnesium in rat
Bludau and Heite C255/54
(egg white)
Pelentan in rat
Trnavsky et al C6478/55
(hyaluronidase)
Phenylbutazone ↓ in rat
Hillebrecht B99120/54
(egg white kaolin)
Prolase B ↓ in rat
Martin et al B98149/54
(egg white)
Pyrazolon derivatives in rat
Hillebrecht B99128/54
(egg white kaolin)
Quercetine in rat
Trnavsky et al C6478/55
(hyaluronidase)
Rauwolfia ↓ in rat
Riechert and Eschbach C6678/55
(egg white)
Rutin in rat
Trnavsky et al C6478/55
(hyaluronidase)
Salicylate in rat
Trnavsky et al C6478/55
(hyaluronidase)
Streptokinase ↓ in rat
Martin et al B98149/54
(egg white)
Strontium salts ↓ in rat
Bludau and Heite C255/54
(egg white)
Trypsin in rat
Adamkiewicz et al C4065/55
(yeast egg white kaolin)
Beiler et al C6294/55
(dextran yeast)
Trypsin Ø in rat
Adamkiewicz et al B98861/54
(kaolin—chronic phase)
Trypsin ↓ in rat
Adamkiewicz et al B98861/54
(kaolin—acute phase egg white yeast filtrate)
Martin et al C521/53
B98149/54 (egg white)
Venostasin ↓ in rat
Stepantschitz and Kresbach
B98651/54 (formalin)
Protein deficiency ↓ in rat
Kelemen et al C1486/55
(hyaluronidase)

JOINT DISEASES

Rheumatoid Arthritis

Review
Lucherini B99093/ND
Various authors C860/52
Pathogenesis
Bohrod C3404/55 (G A S)
Boots and McCollom C6092/42
(focal infection)
Catel C985/52 (G-A S)
Cecil and Angevine C6093/38
(focal infection)
Clerens C4761 53
(G-A S pulmonary diseases)
Copeman C3857/53 (G-A S)
Dresner C3202/55 (review)
Duthie B98033/54 (G A S)
Good C5643/53 (muscles)
Goulding et al B99050/54 (G-A S)
Hochrein and Schleicher C981/52
(G A S)
Lansbury and Rogers C6797/55
(hydralazine)
Muller et al C2744/55
(apresoline)
Pincus C3406/55 (adrenals)
Reinhardt and Waldron B96601/54
(apresoline)
Weissbecker C5437/54 (adrenals)

Rheumatoid Arthritis ← Stimuli

Denervation (buffer nerves)
Shimizu B97659/52

ACTH and/or cortisone
Bach C3853/53
Beattie and Hartfall C5842/55
(ACTH i v)
Bertini C307/54
(ACTH gelatine)
Boots B97327/54
Brodkin C680/54
Bunim C1377/54
Bunim et al C708/54
C2806/55 (cortisone long term)
Copeman C5019 C3857/53
(review)
Coste and Cayla C597/53
Coste et al C4762/54 C4765/54
Doglotti and Magri B99509/53
(discussion)
Duthie B98280/54 (critique)
Fischer C5582/55 (review)
Fletcher et al C5854/53
(ACTH long acting)
Frenkel and Groen C3959/54
(ACTH long term)
Hartfall B98134/54
(ACTH intravenous infusion)
Hench and Ward B97169/54
(review)
Holub C4433/55 (discussion)
Kelly *C1947/55 (discussion)*
Kersley B97894/53 (discussion)
Kinsell C1364/54
Kuipers B98528/54
Langeron and Giard B96818/53
Losada and Zanartu C398/53
Lowman C5607/55
McEwen C1375/54
Moreno C3851/53
Prowse B99049/54
Ragan C832/54 (discussion)
Richards B98841/54
Schmid B96519/53
Sitzerman C2820/55
Weil et al B96822/53
(ACTH infusion with
hyaluronidase)
West C1[illegible]76/54
West and Newns C3267/55
(ACTH and cortisone long term)
ACTH (long acting)+Cortisol
(locally)
Boni B96824/53
ACTH+*Aminopyrine* gentisate
Mainoli and Piccinelli C6176/54
ACTH+Ascorbic acid+ATP
Ra[illegible]eta B99090/54
ACTH+Irgapyrin
Schmid C6180/54
ACTH+Nitrogen *mustard*
Ballestero C3937/54
Vasopressin
Haydu B99928/54 (discussion)
Corticoids
Boland C3198/55 (*review*)

Corticoids (halogenated with double bond
–discussion)
Anonymous C6411/55
Corticoids+Phenylbutazone
Gaudin and Kuzell B98550/53
Cortisone
(see ACTH and/or cortisone)
Cortisone+DOCA Ø
Goulding et al B99056/54
Cortisone+*Antabuse*
Wiesel and Barritt B96909/53
Cortisone+Aurothioglucose
Warter C663/54
Cortisone+Gold
Greif C1[illegible]93/54
Cortisone withdrawal
Slocumb B96525/53
Cortisone (locally)
Robecchi and Daneo B97830/53
Cortisol
Boland C5935/55 *(review)*
Copeman C3857/53 (discussion)
Fiore B96526/53
Hench and Ward *B97169/54*
(review)
Kelly C1947/55 (discussion)
Rosenfeld B98527/54
Cortisol (locally)
Coste et al B96527/53
Duff et al C660/54
Duthie B98280/54
(discussion)
Freyberg et al. C3852/53
Horton C1492/55
(in temporomandibular joints)
Hollander C6256/55
Hollander et al B97831/54
Kuipers B98481/53
Robecchi and Capra B96529/53
Robecchi and Daneo B97830/53
Rosenfeld B98527/54
Weiss et al B99556/54
Weissmann Netter et al
B98529/54 C1000/54
Cortisol+Insulin+Diabetes mellitus
Rosenfeld B98527/54
Cortisol (locally)+Balneologic conditions
Françon and Françon C51/54
Cortisol benzoate (locally)
Hollander et al C1362/54
C1379/54
Cortisol butylacetate (locally)
Hollander et al C1362/54
C1379/54
Cortisol caprylate (locally)
Hollander et al C1362/54
C1379/54
Cortisol tertiary butylacetate
(locally)
Hollander et al C5640/55
Allo dihydro-cortisol (locally)
Hollander et al C1362/54
C1379/54

9α chlorocortisol (locally)
Hollander et al C1362/54
C1379/54
9α fluorocortisol
Ballabio et al C4816/55
Boyles C1373/54
Boland C1372/54 C3196/55
(review) C6246/55
Boland and Headley C682/54
C1360/54
Bunim 1374/54
Hollander et al C1362/54 (locally)
Ward and Hench C6250/55
Ward et al C683/54 C836/54
Δ cortisone
Ballabio et al C4816/55
Bollet et al C5638/55
Bunim et al C1179/55 C5936/55
Dordick and Gluck C4779/55
Hollander C6236/55 (locally)
Margolis et al C5637/55
Ward and Hench C6250/55
Δ cortisol
Bollet et al C5638/55
Bunim et al C1179/55 C5936/55
Hollander C6236/55 (locally)
Aldosterone
Mach and Fabre C3654/55
Ward and Hench C6250/55
Ward et al C683/54 C836/54
Cafestrol in man
Piotti C1653/54
Luteoids
Colomer C3948/54 (discussion)
von Mundy and Friedl B99314/53
Pregnancy
Bianchi B98476/53 (discussion)
Robinson et al C2479/55
(discussion)
Etiocholane 3 11β diol 17 one
Plantin and Burke C5684/55
Pregnenolone
Limongelli and Hadad C6178/53
Thyroidectomy
Laine et al B98132/54

Rheumatoid Arthritis ← Stressors

Hepatitis (infectious)
Zelter C6145/53
Icterus
Bianchi B98476/53 (discussion)
Periarteritis nodosa
Ball C1359/54
ABA (phenothiazin derivatives)
Broglie and Jorgensen B99209/54
ATP
Perez B96825/53
Chloramine
Valeri and di Raimondo
B98479/53
Gold
Kleinsorge et al C697/54
Heparin (locally)
Greif and Wenning B99799/53
Paraaminobenzoate+Salicylate
Zarafonetis et al B96821/53
Phenylbutazone
Robecchi et al B96521/53
Placenta extract
Pasquali and Arpesella B97703/5?
Placental tissue implant
Lintz C5021 54 C3022/54
Salicylates
Copeman C5857/53 (discussion)
Loxton and le Vay B97141/54
(discussion)
Roskam B99798/54 (discussion)
West C1376/54
Thromboplastin+Trypsin
Peterman C1554/54
Venostasin
Stepantschitz and Kresbach
B95651/54
Diacephalorachidian therapy
Boschi C467/52

Rheumatoid Arthritis → Targets

Resistance ← ACTH ↑+Gold
Holbrook B96659/50
BMR ← ACTH
Fischer C5382/55
BMR ← Aldosterone Ø
Ward et al C836/54
Body weight ← STH
Kinsell C4257/55
Body weight ← Cortisone ↑+Obesity
Langeron and Giard B96818/53
Body weight ← Δ^1 cortisol Ø
Bunim et al C1179/55
Body weight ← Aldosterone ↑
Ward et al C836/54
Glucose in blood ← Δ cortisone
Bunim et al C5935/55
Glucose in blood ← Δ cortisol
Bunim et al C1179/55 C5936/55
Cholesterol in blood ← ACTH
Fischer C5382/55
Cholesterol in blood ← Δ cortisone ↑
Bunim et al C5936/55
(total cholesterol)
Cholesterol in blood ← Δ cortisol ↑
Bunim et al C1179/55 C5936 55
(total cholesterol)
↑ Mucopolysaccharides in lymph nodes
Rubens Duval B99375/53
Nitrogen balance ← Cortisone (long term)
Calkins et al C1378/54
Nitrogen balance ← 9 fluorocortisol Ø
Ward et al C836/54
Nitrogen balance ← Δ cortisol
Bunim et al C1179/55
Nitrogen in blood (C reactive protein
glycoprotein mucoprotein
γ globulin)
Shetlar et al C4155/55

Nitrogen in blood ← Δ cortisol
Bunim et al C1179/55
Nitrogen in urine ← STH
Kinsell C4257/55
Nitrogen in urine ← Δ^1 *cortisone*
Δ *cortisol*
Bunim et al C5936/55
Protein fractions in blood
Roy et al C6768/55
Protein in blood ← ACTH
Fischer C5382/55
Protein in blood ← *9α fluorocortisol Ø*
Ward et al C836/54
Protein in blood ← Δ cortisone
Δ cortisol
Bunim et al C5936/55
Protein in blood ← Aldosterone Ø
Ward et al C836/54
Albumin in blood ← Δ cortisol ↑
Bunim et al C1179/55
Amino acid in urine
Roy et al C6768/55
C reactive protein in blood
McEwen and Ziff C4813/55
C reactive protein ← Δ cortisol ↓
Bunim et al. C1179/55
Creatinine in urine ← Δ cortisone
Δ cortisol
Bunim et al. C5936/55
Fibrinogen in blood
Peterman C1554/54
Fibrinogen in blood ← *ACTH*
Fischer C5382/55
Globulins in blood ← ACTH and /or
cortisone
Schmid B96519/53
Globulins in blood ← Δ cortisol ↓
Bunim et al C1179/55
Globulins in synovial fluid ← Cortisol
(locally)
Platt et al B99538/54
Hexo amine in blood ← ACTH cortisone
Boas et al C5708/55
↓ Histidine in urine
Holbrook B96689/50
Histidine in urine ← (ACTH and/or
cortisone) ↑
Holbrook B96689/50
Histidine in urine ← Adrenaline Ø
pregnancy ↑ testoids Ø
thyroid extract Ø
Holbrook B96689/50
Histidine in urine ← Icterus ↑
Holbrook B96689/50
Histidine in urine ← Amino acid
Holbrook B96689/50
Histidine in urine ← Ascorbic acid Ø
Holbrook B96689/50
Prothrombin in blood ← ACTH
Fischer C5382/55
Urea in blood ← Δ cortisol
Bunim et al C1179/55

Cl in blood ← Δ cortisol
Bunim et al C1179/55
Na balance ← Cortisone (long term)
Calkins et al C1378/54
Na balance ← Δ^1 cortisol Ø
Bunim et al C1179/55
Calkins et al. C1379/54
Na in blood ← Cortisone ↑
Goulding et al B99038/54
Na in blood ← Cortisone+DOCA ↓
Goulding et al B99036/54
Na in urine ← *9α fluorocortisol* ↓
Bunim C1374/54
Na in urine ← Δ cortisone
Δ cortisol
Bunim et al C5936/55
↑ Na in synovial fluid
Yielding et al B99332/54
B99557/54
Na in synovial fluid ← *Cortisol (locally) Ø*
Yielding et al. B99557/54
NaCl in blood ← Aldosterone Ø
Ward et al C836/54
NaCl in urine ← 9 fluorocortisol ↓
Ward et al C836/54
NaCl in urine ← Aldosterone ↓
Ward et al. C836/54
Potassium balance ← Δ cortisol Ø
Bunim et al C1179/55
Potassium in blood ← ACTH
Fischer C5382/55
Potassium in blood ← 9 fluorocortisol ↓
Ward et al C836/54
Potassium in blood ← *Aldosterone*
Ward et al C836/54
Potassium in urine ← STH
Kinsell C4257/55
Potassium in urine ← Δ cortisone
Δ cortisol
Bunim et al B5936/55
Potassium in urine ← *9α-fluorocortisol* ↑
Ward et al. C836/54
Potassium in synovial fluid
Yielding et al B99332/54
B99557/54
Potassium in synovial fluid ← Cortisol
(locally) Ø
Yielding et al B99557/54
Calcium in blood ← Δ cortisol Ø
Bunim et al C1179/55
Calcium in blood ← Aldosterone Ø
Ward et al. C836/54
Phosphorus in blood ← Δ^1 *cortisol*
Bunim et al. C1179/55
Phosphorus in blood ← Aldosterone Ø
Ward et al. C836/54
Phosphorus in urine ← STH
Kinsell C4257/55
↑ Phosphorus radioactive in connective
tissue
Lovegren and Orstrom B96758/54
Water balance ← 9α fluorocortisol
Boland and Headley C1360/54

Corticoids in urine
Appleby and Norymberski C6765/55 (17 ketogenic steroids 17 hydroxycorticoids 17 hydroxy 20 keto steroids)
Fischer C5382/55

↓ Cortisone in urine
Vermeulen and Bekaert C3376/54

↓ *Tetrahydrocortisone in urine*
Vermeulen and Bekaert C3376/54

Cortisol in urine
Vermeulen and Bekaert C3376/54

Tetrahydrocortisol in urine
Vermeulen and Bekaert C3376/54

Corticoids in urine ← ACTH + Citric acid fructose glutamic acid oxalacetic acid phosphoglyceric acid pyruvic acid
Stuhlfauth et al C6534/54

Corticoids in urine ← Cortisone ↑
Vermeulen and Bekaert C3376/54 (17 hydroxycorticoids)

Corticoids in urine ← 9α fluorocortisol Ø
Ward et al C836/54

Corticoids in urine ← 9α fluorocorticol ↓
West C6764/55 (17 hydroxycorticoids)

Corticoids in urine ← Aldosterone Ø
Ward et al C836/54 (chemistry)

Corticoids (and metabolites) in synovial fluid ← Cortisone (locally)
McEwen et al C849/54 (17 hydroxycorticoids)
Wilson et al C1371/54 C6235/55

Corticoids (and metabolites) in synovial fluid ← Cortisol (locally)
McEwen et al C849/54 (17 hydroxycorticoids)
Wilson et al. C1371/54 C6235/54

17 KS in urine
Fischer C5382/55
Houh C3953/54

17 KS in urine ← ACTH
Fischer C5382/55

17 KS *in urine* ← *Adrenal irradiation* (ionizing ↓)
Wielding B96819/53

17 KS *in urine* ← Cortisone withdrawal
Fischer C5382/55

17 KS in urine ← 9α fluorocortisol
Ward et al C836/54
West C6764/55

17 KS in urine ← Δ cortisone
Bunim et al C5936/55

17 KS in urine ← Δ cortisol ↓
Bunim et al. C1179/55 C5936/55

17 KS in urine ← Aldosterone Ø
Ward et al. C836/54

17 KS in urine ← Cold
Kleinsorge et al C697/54
Schaposnik and Gutierrez B96925/53

17 KS in synovial fluid ← Cortisone (locally) cortisol (locally)
McEwen et al C849/54

↓ Folliculoids in urine
Enzinger C3116/54

Folliculoids in urine ← ACTH ↑
Enzinger C3116/54

Pregnanediol in urine ← Luteoids
Roy et al. C6766/55

↑ Aminotripeptidase in synovial fluid
Liff et al C925/55

Cholinesterase in blood synovial fluid
Oka C1760/54 (discussion)

↓ Cholinesterase in blood
Santenoise et al B97102/54

β glucuronidase in synovial fluid
Jacox and Feldmahn C4196/55

Hyaluronidase inhibitor in blood ← ACTH
Fischer C5382/55

Phosphatase (alkaline) in blood ← Δ cortisol
Bunim et al. C1179/55

Carbon dioxide in blood ← 9α fluorocortisol
Ward *et al* C836/54

Carbon dioxide in blood ← Δ cortisol
Bunim et al C1179/55

Carbon dioxide in blood ← Aldosterone Ø
Ward et al C836/54

Psyche ← Δ cortisone Δ¹ cortisol
Bunim et al. C5936/55

Adrenals (histology) ← ACTH and/or cortisone
Fletcher and Rose B99932/54

Blood count ← ACTH
Fischer C5382/55 (eosinophils)

Blood count ← ACTH (long term)
West and Newns C3267/55 (leucocytes)

Blood count ← Cortisone ↓
Goulding et al B99036/54 (eosinophils)

Blood count ← Cortisone + DOCA ↑
Goulding et al B99036/54 (eosinophils)

Blood count ← *9α fluorocortisol Ø*
Ward et al C836/54 *(leucocytes eosinophils)*

Blood count ← Δ cortisone
Bunim et al. C5936/55 (eosinophils)

Blood count ← Δ cortisol ↓
Bunim et al C1179/55 C5936/55 (eosinophils)

Blood count ← Aldosterone Ø
Mach and Fabre C3654/55
(eosinophils)
Ward et al C836/54
(leucocytes eosinophils)

Blood count ← Balneology
Storck C468/54
(erythrocytes leucocytes eosinophils lymphocytes)

Hematocrit ← Δ cortisol
Bunim et al C1179/55

Hemoglobin ← ACTH
Fischer C5382/55

Hemoglobin ← Δ *cortisol*
Bunim et al C1179/55

ESR ← ACTH
Fischer C5382/55

ESR ← *Cortisone* ↓
Goulding et al B99036/54

ESR ← Cortisone+DOCA Ø
Goulding et al B99036/54

ESR ← Δ *cortisol* ↓
Bunim et al C1179/55

ESR ← Aldosterone Ø
Ward et al *C836/54*

Blood coagulation (*heparin tolerance* test) ← Cortisone
Cervini et al B98467/53

Blood coagulating time ← Cortisone ↓+ Heparin
Cervini et al B89914/53

Capillaries
Pirtkien C3954/54

Heart vessels ← ACTH
Fischer C5382/55

Blood flow (digital) ← *Cortisone* ↑
Catchpole et al C1563/54

↓ Blood pressure (diastolic)
Turner and Lansbury C6177/54

Blood pressure ← 9α fluorocortisol
Boland C6246/55
Boland and Headley C1360/54

Blood pressure ← Δ cortisol
Bunim et al *C1179/55*

Blood pressure ← Aldosterone Ø
Ward et al C836/54

↓ Capillary pressure
Pirtkien C3954/54

Capillary pressure ← Corticoids+ Vitamin E
Pirtkien C3954/54

Capillary pressure ← *Thio emicarbazone*
Pirtkien C3954/54

↑ Capillary permeability
Junet and Berthoud C3016/54

Capillary permeability ← Cortisone ↓
Junet and B rthoud C3016/54

Lymph nodes ← Δ cortisol ↓
Bunim et al. C1179/55 (weight)

Capillary resistance
Galmiche et al B97829/53
Junet and Berthoud C3016/54
Stepantschitz and Kresbach B98651/54

Capillary *resistance* ← (ACTH and/or *cortisone*) ↑
Galmiche et al B97829/53
Junet and Berthoud C3016/54

Capillary resistance ← Venostasin ↑
Stepantschitz and Kresbach B98651/54

Bone marrow
Houli and Marinho C1366/54
(*histology*)

Bone marrow ← Cortisone (long term)
Tillis and Goldman B98480/54

Kidney ← Cortisone
Benda et al C1010/53 (function)

Gastrointestinal ulcer ← Δ cortisone
Δ cortisol
Bunim et al C5936/55

Liver (function) ← *ACTH* and/or cortisone
Schmid B96519/53

Bones ← *ACTH*
Fischer C5382/55

↓ Skin (elasticity)
Stepantschitz and Kresbach B98651/54

Skin (connective tissue) ← ACTH
Fischer C5382/55

Skin (elasticity) ← Venostasin ↑
Stepantschitz and Kresbach B98651/54

Pigment in skin ← ACTH (long term)
West and Newns C3267/55

Collagen (in skin) ← Cortisone
Keech C6796/55

Inflammation (tuberculin test) ← ACTH
Fischer C5382/55

Inflammation (after nicotinic acid ester to skin) ← Cortisone
Vaillancourt B96841/54

Serologic reactions ← ACTH
Bianchi B98476/53
Fischer C5382/55

Serologic reactions ← Δ -cortisol Ø
Bunim et al C1179/44
(*sheep cell reaction*)

Serologic reactions ← Ultrasonic waves phenylbutazone salicylate
Bianchi B98476/53

Osteoarthritis

Pathogenesis (*focal infection*)
Fundner and Florian C5938/54

Corticoids in urine
Appleby and Norymberski C6765/55 (17 ketogenic steroids 17 hydroxycorticoids 17 hydroxy 20 keto-steroids)
Fischer C5382/55
↓ Cortisone in urine
Vermeulen and Bekaert C3376/54
↓ Tetrahydrocortisone in urine
Vermeulen and Bekaert C3376/54
Cortisol in urine
Vermeulen and Bekaert C3376/54
Tetrahydrocortisol in urine
Vermeulen and Bekaert C3376/54
Corticoids in urine ← ACTH + Citric acid fructose glutamic acid, oxalacetic acid phosphoglyceric acid pyruvic acid
Stuhlfauth et al C6534/54
Corticoids in urine ← Cortisone ↑
Vermeulen and Bekaert C3376/54 (17 hydroxycorticoids)
Corticoids in urine ← 9α fluorocortisol Ø
Ward et al C836/54
Corticoids in urine ← 9α fluorocorticol ↓
West C6764/55 (17 hydroxycorticoids)
Corticoids in urine ← Aldosterone Ø
Ward et al C836/54 (chemistry)
Corticoids (and metabolites) in synovial fluid ← Cortisone (locally)
McEwen et al C849/54 (17 hydroxycorticoids)
Wilson et al C1371/54
C6235/55
Corticoids (and metabolites) in synovial fluid ← Cortisol (locally)
McEwen et al C849/54 (17 hydroxycorticoids)
Wilson et al. C1371/54 C6235/54
17 KS in urine
Fischer C5382/55
Houk C3953/54
17 KS in urine ← ACTH
Fischer C5382/55
17 KS in urine ← Adrenal irradiation (ionizing ↓)
Wielding B96819/53
17 KS in urine ← Cortisone withdrawal
Fischer C5382/55
17 KS in urine ← 9α fluorocortisol
Ward et al C836/54
West C6764/55
17 KS in urine ← Δ cortisone
Bunim et al C5936/55
17 KS in urine ← Δ cortisol ↓
Bunim et al. C1179/55 C5936/55
17 KS in urine ← Aldosterone Ø
Ward et al. C836/54
17 KS in urine ← Gold
Kleinsorge et al. C697/54
Schaposnik and Gutierrez B96925/53
17 KS in synovial fluid ← Cortisone (locally) cortisol (locally)
McEwen et al C849/54
↓ Folliculoids in urine
Enzinger C3116/54
Folliculoids in urine ← ACTH ↑
Enzinger C3116/54
Pregnanediol in urine ← Luteoids
Roy et al C6766/55
↑ Aminotripeptidase in synovial fluid
Ziff et al C925/55
Cholinesterase in blood, synovial fluid
Oka C4760/54 (discussion)
↓ Cholinesterase in blood
Santenoise et al B97102/54
β glucuronidase in synovial fluid
Jacox and Feldmahn C4196/55
Hyaluronidase inhibitor in blood ← ACTH
Fischer C5382/55
Phosphatase (alkaline) in blood ← Δ^1 cortisol
Bunim et al C1179/55
Carbon dioxide in blood ← 9α fluorocortisol
Ward et al. C836/54
Carbon dioxide in blood ← Δ cortisol
Bunim et al C1179/55
Carbon dioxide in blood ← Aldosterone Ø
Ward et al C836/54
Psyche ← Δ cortisone Δ^1 cortisol
Bunim et al. C5936/55
Adrenals (histology) ← ACTH and/or cortisone
Fletcher and Rose B99932/54
Blood count ← ACTH
Fischer C5382/55 (eosinophils)
Blood count ← ACTH (long term)
West and Newns C3267/55 (leucocytes)
Blood count ← Cortisone ↓
Goulding et al B99036/54 (eosinophils)
Blood count ← Cortisone + DOCA ↑
Goulding et al B99036/54 (eosinophils)
Blood count ← 9α fluorocortisol Ø
Ward et al C836/54 (leucocytes eosinophils)
Blood count ← Δ cortisone
Bunim et al C5936/55 (eosinophils)
Blood count ← Δ cortisol ↓
Bunim et al C1179/55
C5936/55 (eosinophils)

Felty s syndrome ← Cortisone+
Splenectomy
van Slyck B98501/54
Ganglion ← Cortisol (locally)
Anonymous B97889/54
(discussion)
Golfer s elbow ← Cortisol (locally)
Crisp and Kendall C2786/55
Gougerot Sjogren s syndrome ←
Cortisone
Offret and Massin C5779/54
Heberden s nodes—Pathogenesis
(menopause)
Stecher C6469/55
Joint infections—Pathogenesis (G A S)
Wanke B98948/53
Osteoarthropathy (hypertrophic)—
Pathogenesis (G A S after
bronchial cancer)
Semple and McCluskie C6421/55
Osteoarthrosis—Pathogenesis (hypophysis
adrenals diabetes mellitus)
Boulet and Mirouze C4724/54
Paratenonitis crepitans ← Cortisol
(locally)
Meier C661/54
Reiter s syndrome ← Cortisone
Capparelli C5778/54
Rheumatism (palindromic) ← ACTH
Lewitus C5018/54
Rheumatism (palindromic) ← Pregnancy
Lewitus C5018/54
Shoulder syndrome ← ACTH and/or
cortisone
Bach C3855/53
(shoulder hand syndrome)
Buck C1026/54 (frozen
shoulder ← Cortisone locally)
Craig and Witt C3752/55
(shoulder arm hand syndrome—
discussion)
Hartfall B98134/54
(frozen shoulder ← ACTH i v)
Savage C3856/53
(frozen shoulder)
Shoulder syndrome ← Cortisol (locally)
Craig and Witt C375_/55
(shoulder arm hand syndrome—
discussion)
Crisp and Kendall C_786/55
C6409/55 (periarthritis)
Kuipers C 0_0/54 (periarthritis)
Meier C661/54 (periarthritis)
Robecchi and Capra B965_9/53
(acute periarthritis)
C6185/53 (periarthritis)
Still s disease ← ACTH and/or cortisone
Welch and Forsyth B99559/53
Styloiditis ← Cortisol (locally)
Teixeira and Barata C3956/54
Temporomandibular joint disease ←
Cortisol (locally)
Henny C640/54

Tendoperiostitis ← Cortisol (locally)
Meier C661/54
Teixeira and Barata C3956/54
Tennis elbow ← Cortisol (locally)
Crisp and Kendall C2786/55
Tennis elbow ← Cortisol (locally
with hyaluronidase)
Crisp and Kendall B96837/54
Tenosynovitis ← Cortisone
de Quervain B98831/53
Tenosynovitis ← Cortisol (locally)
Christie C6410/55
(Quervain s disease)
Crisp and Kendall C2786/55
Tempest C3178/55 (discussion)
Trigger finger ← Cortisol (locally)
Tempest C3178/55 (discussion)
Various joint diseases ← Cortisol (locally)
Lievre et al B96528/53
Various joint diseases ← Cortisol (locally)
+Balneologic conditions
Françon and Françon C51/54
Various joint diseases ← Hyaluronidase
(locally—discussion)
Anonymous C6353/55
Various joint diseases ← Nitrogen mustard
Erlsbacher et al C5775/54
Various joint diseases → Aminotripeptidase
in synovial fluid
Ziff et al C925/55
Various joint diseases → β glucuronidase in
synovial fluid
Jacox and Feldmahn C4196/55

MUSCULAR SYSTEM

(For earlier pertinent data cf also *Stress* pp 651 655 AROS 1951 pp 380 382 AROS 1952 pp 247 248 AROS 1953 pp 317 319 AROS 1954 pp 474 475)

Muscles ← Stimuli

Hypophysectomy+Thyroxin Ø in rat
Scow B97432/54
(levator ani muscle—weight)
Hypophysectomy+Thyroxin ↑ in rat
Scow B97432/54
(thigh muscle—weight)
ACTH+Casein+Potassium chloride+
Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
ACTH+*Potassium chloride+Protein*
deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
ACTH ↑+Protein deficiency in rat
Aschkenasy and Dray B99606/54
(weight)
STH Ø+Ionizing rays in rat
Sellers and Barlow B98693/54
(weight/body weight)

Osteoarthritis ← Various

Hypothalamus irradiation (ionizing rays) + Adrenal irradiation (ionizing rays)
  Pfundner and Florian C3958/54
ACTH and/or cortisone
  Bach C3855/53
  Beattie and Hartfall C5842/55 (ACTH i v)
  Ferond B98466/53 (discussion)
Cortisol (locally)
  Kuipers B98481/53 C5020/54
  Stecher C3478/54 (discussion)
  Weiss et al B99556/54
Cortisol tertiary butylacetate (locally)
  Hollander et al C5640/55
Vaccine (typhoid)
  Solomon et al B99056/54
Phenylbutazone
  Platoff B96520/53

Osteoarthritis → Targets

Stomach (ulcer perforation) ← Phenylbutazone
  Beutler and Bergenstal B99248/53

Spondylarthritis

Spondylarthritis ← Various

ACTH and/or cortisone
  Bagnall et al C399/53
  Beattie and Hartfall C5842/55 (ACTH i v)
  Copeman C5857/53 (ankylosing—discussion)
  Houli C4433/55 (discussion)
  Kersley B97894/53 (discussion)

Spondylarthritis → Targets

Protein in blood ← Cortisone Ø
  Fischer and Hastrup B96681/54
Potassium calcium in blood ← Cortisone
  Fischer and Hastrup B96681/54
Calcium retention ← Cortisone ↓
  Fischer and Hastrup B96681/54
Calcium retention ← Cortisone + MAD ↑ + Calcium + Vitamin D
  Fischer and Hastrup B96681/54
Phosphorus in blood ← Cortisone Ø
  Fischer and Hastrup B96681/54
Hemoglobin ← Cortisone ↓
  Fischer and Hastrup B96681/54
ESR ← Cortisone ↓
  Fischer and Hastrup B96681/54

Other Joint Diseases

Review
  Various authors C860/52
Arthritis (infectious) ← ACTH and/or cortisone
  Bertani C2819/55
Arthritis (infectious) ← Cortisol (locally)
  Strach C5379/55
Arthritis → Corticoids in urine *(fractions)*
  Pincus et al C1749/53
Arthritis → Corticoids in synovial fluid (fractions) ← Cortisol (locally)
  Pincus et al C1749/53
Arthritis → Blood count ← Cortisone cortisol (locally)
  Danco and Filogamo B99313/54
Arthritis → LSR ← Cortisone cortisol (locally)
  Danco and Filogamo B99313/54 (of synovial fluid)
Arthropathy (psoriatic) ← ACTH (i v)
  Beattie and Hartfall C5842/55
Arthropathy ← Adrenaline (dielectrolysis)
  Barbier C5774/54
Arthropathy ← *Vitamin E*
  Sturm B99257/53
Arthrosis—Pathogenesis (acromegaly)
  Junkersdorf B98653/53
Arthrosis ← Cortisol (locally)
  Coste et al B96527/53
  Robecchi and Capra B96529/53
Arthrosis ← DOCA + Testoids + Elpimed
  Sommer C2450/53
Arthrosis → Blood count ← Cortisone cortisol (locally)
  Danco and Filogamo B99313/54
Arthrosis → ESR ← Cortisone cortisol (locally)
  Danco and Filogamo B99313/54
Bursitis ← Cortisol (locally)
  Crisp and *Kendall C2786/55*
  Kuipers C5020/54
Chronic joint diseases ← ACTH and/or cortisone + Gold
  Ratti and Ballabio C5017/54
Disc syndrome—Pathogenesis (*G A S*)
  Anonymous C5697/55
  Scott C5464/55
Dupuytren s contracture ← Cortisol (*locally*)
  Crisp and Kendall C2786/55
  Tempest C3178/55 (discussion)
Epicondylitis ← Cortisol (locally)
  Meier C661/54
  Teixeira and Barata C 956/54
Felty s syndrome ← ACTH and/or cortisone
  Ellman et al C6471/55
  Justin Besançon et al C400/54

MUSCLES ← STRESSORS

Heat in man
Craig et al C3323/54
(work performance)
Cold in mouse
Hart B96615/53
(running capacity)
Cold (repeated) in rabbit
Carlson C5065/55
(electromyogram)
Ultrasound in guinea pig
Introna C4606/53 (histology)
Nerves (sound) + Diurnal variations in mouse
Halberg et al C2772/55
(convulsions)
Muscular exercise + Fasting in man
Henschel et al C1671/54
(work performance)
Hypoxia in rat
Hoelscher C2699/54
(work performance)
Egg albumin (i p) in rat
Scheiffarth and Berg B99788/53
(histology)
Glucose in rat
Marceron C3330/53
(work performance)
Potassium chloride ↑ in rat
Milton C139/53 (duration of muscle action potential)
Diet (fat wheat germ oil) in guinea pig
Ershoff and Levin C5319/55
(swimming performance)
Diurnal variations in man
Kuchmeister C1864/54
(internal muscle pressure)

Muscular Diseases

Dystonia of smooth muscles—Pathogenesis (adrenals)
Pock Steen B98461/53
Dystrophia myotonica → Corticoids 17 KS in urine ← ACTH GTH
Kappas et al C4314/55
Muscular dystrophy—Pathogenesis (endocrines)
Lesny and Drechsler C5783/54
Muscular dystrophy ← Hypophyseal implant
Lesný and Drechsler C5783/54
Muscular dystrophy ← ACTH and/or cortisone
Schermann C4435/53
(discussion, climacteric)
Muscular dystrophy → Creatine in urine ← Thyroxin
Lesný and Drechsler C5783/54
Myasthenia ← ACTH and/or cortisone
Hoefer B98855/54 (discussion)
Myasthenia gravis—Pathogenesis (hypophyseal anterior lobe—eosinophilic hyperplasia + thymus tumor)
Fondón B97395/53
Myasthenia gravis ← ACTH
Rousseau B97201/54 (discussion)
Takaoka et al C5674/55
Myasthenia gravis ← Parolin
Takaoka et al C5674/55
Myositis (infectious) ← ACTH and/or cortisone
Omens B98524/54
Myositis (rheumatic) ← Cortisone
Rubsaamen B99365/54
Myositis ossificans ← ACTH and/or cortisone
Lockhart and Burke B99552 54
Myositis ossificans ← Cortisol (locally)
Meier C661/54

SKIN AND APPENDAGES

(For additional data cf also chapters "Serology" and "Inflammation")

(For earlier pertinent data, cf also *Stress* pp 726-759 AROS 1951 pp 418-432 AROS 1952 pp 268-275 AROS 1953 pp 339 345 AROS 1954 pp 493-498)

Skin ← Stimuli

Infundibular stalk section in toad
Rowlands C5545/54 (pigment)
Hypophysectomy in rat
Houssay C2250/54 (hair growth)
Hypophysectomy in toad
Rowlands C5545/54 (pigment)
Hypophysectomy + STH in fish
Pickford B97426/54 (scales)
Hypophysectomy + STH in rat
Selye and Salgado C4970/55
Hypophysectomy + Folliculoids (locally) in rat
Ebling C1794/55 (histology sebaceous glands mitosis)
Hypophysectomy + Age in rat
Ebling C1794/55 (histology sebaceous glands mitosis)
Hypophyseal irradiation (ultrasonic) in guinea pig
Cicardo et al B97563/53
(histology)
Hypophyseal extract (MTH) + Blood (of carcinomatous patients) in frog
Kádas C4097/54
(pigment in skin)
ACTH
Raffel C3405/55 (hypersensitivity reactions—discussion)
ACTH in frog
Deutsch et al C1614/54 (pigment)

Cold + ABA (ergot derivatives) Ø in man
Glaser and Lee B96632/53
(sweating)
Cold + ABA (atropine) ↓ in man
Glaser and Lee B96632/53
(sweating)
Cold (one or several exposures) +
Ascorbic acid ↓ in monkey
Dugal B96419/52
(incidence of frostbite)
Ionizing rays in rat
Upton and Gude C3289/54
(mast cells polysaccharides)
Nerves (emotions) + Rauwolfia in fish
Turner and Carl C6104/55
(melanophores)
Nerves (light) in frog
Edgren B99652/54
(melanophores)
Serum (horse) + Pyrogen (bacterial)
in rabbit
Bennett et al B99815/53
ABA + Histamine (locally) in rat
Prassoli C104/53 (histology)
Iodine in rat
del Conte and Stux C6754/54
(mast cells)

CUTANEOUS DISEASES

Lupus Erythematosus

Pathogenesis
Benmussa B97832/53
(hypophysis adrenals Sheehan s syndrome)
Bohrod C3404/55 (C A S)
Inderbitzin B99376/53
(mucopolysaccharides)
Lansbury and Rogers C6797/55
(hydralazine)
Muller et al C2744/55
(apresoline)
Reinhardt and Waldron B96601/54
(apresoline)
Shackman et al B96602/54
(apresoline)

Lupus Erythematosus ← Various

ACTH and/or cortisone
Aron Brunetiere B97825/53
(ACTH implantation)
Asboe Hansen C833/54
(discussion)
Baehr and Levitt B97171/54
(review)
Baptista and Belliboni C5781/54
Benmussa B97832/53
Brunsting C678/54
Castillo B97_87/54
Cosnett B97833/54
Creyx et al B96530/53
Cruz and Harnecker C3026/53
Cruz et al C2509/54
Danopoulos and Melissinos C5760/54
Duvois C401/54
Kalhomaki C3024/54
Kinsell C1364/54
Klein C2150/55 (discussion)
Kushniruk C5025/54
Malamud and Saver B97875/54
Matthews and Meynell B99933/54
Muller et al C2744/55
(after apresoline)
Richards B98841/54
Schmidt B97884/54
Soffer et al C6227/55
ACTH and/or cortisone + Adrenal transplant (foetal human)
Homburger and Bonner B97587/54
9α fluorocortisol
Soffer et al C6227/55
Δ cortisone
Dordick and Gluck C4779/55
Robinson C5639/55

Lupus Erythematosus → Targets

Nitrogen in blood (C reactive protein glycoprotein mucoprotein γ globulin)
Shetlar et al C4135/55
Hexosamine in blood ← ACTH cortisone
Boas et al C5708/55
Na/Potassium ratio in skin ← ACTH
Benjamin and Cornbleet C687/54
G Cs in urine
Gil C5600/55
↓ 17 KS in urine
Cruz and Harnecker C3026/54
Gil C5600/55
17 KS in urine ← Cortisone
Cruz and Harnecker C3026/54
Adrenals (weight lipids) ← ACTH (long term)
Soffer C5418/55
Pregnancy ← ACTH and/or cortisone
Kammerling and Turner B99564/54
Inflammation (after nicotinic acid ester to skin) ← Cortisone
Vaillancourt B96841/54

Other Cutaneous Diseases

(For additional data cf also Serologic diseases)

Acanthosis nigricans–Pathogenesis
Curth C959/55 (hypophysis)
Rothman B97597/54
(pituitary basophilism)
Acne conglobata ← ACTH and/or cortisone
Farber and Claiborne B99572/54

ACTH in monkey
Krohn C4503/55 (transplanted)
ACTH in toad
Stoppani et al C5546/54
(pigment)
STH Ø in rat
Selye C320/55 (hair growth)
STH ↑ +Adrenalectomy+DOCA in rat
Selye C320/55 (hair growth)
Adrenalectomy in mouse and rat
Houssay C2250/54 (*hair growth*)
Adrenalectomy + (Cortisone+NaCl) ↓
in man
Bergenstal et al C3657/55
(pigment)
Adrenalectomy + Cortisol ↓ + DOC ↓
in rat
Selye C320/55 (hair growth)
(Adrenalectomy+DOCA) ↑ in man
Bergenstal et al C3657/55
(pigment)
Selye C320/55 (hair growth)
Adrenalectomy + Folliculoids (locally)
Ebling C1794/55 (histology
sebaceous glands mitosis)
Adrenalectomy+Age in rat
Ebling C1794/55 (histology
sebaceous glands mitosis)
Adrenaline frog
Hudson and Bentley C3864/55
(*pigment–discussion*)
Adrenaline+Rauwolfia in fish
Turner and Carl C6104/55
(melanophores)
Noradrenaline in man
Uricchio et al B96471/53
(ulceration)
Adrenaline derivatives+Nerves
(emotions) + Rauwolfia in fish
Turner and Carl C6104/55
(melanophores)
ACE ↑ in fish
Goldman and Wells B97125/54
(pigment reddening)
Cortisone
Raffel C3405/55 (hypersensitivity
reactions–discussion)
Cortisone in baboon
Marois et al C2110/54 (sex skin)
Cortisone in guinea pig
Businco B99102/54 (histology)
Cortisone ↑ in hamster
Toolan B96597/54 (growth of
human embryonic tissue–
transplant)
Cortisone in monkey
Krohn C4503/55 (transplanted)
Cortisone in rabbit
Businco B99102/54 (histology)
Cortisone in rat
Joseph et al B99566/54
(histology)
Cortisone (locally) in rat
Whitaker and Baker C1291/51
(hair growth)
Cortisone+Age (newborn) in rat
Field C4642/54 (hair)
Cortisone+Ionizing rays in rat
Toolan B96597/54 (growth of
human embryonic tissue–transplant)
Cortisol (i c) in man
Atkinson et al C1113/54
Cortisol (locally) ↓ *in rat*
Whitaker and Baker C1291/51
(hair growth)
DOC (locally) in rat
Whitaker and Baker C1291/51
(hair growth)
DOCA in baboon
Marois et al *C2110/54* (sex skin)
DOCA in bird
Kobayashi and Okubo C5441/54
(molting)
Desoxocortisone (locally) Ø in rat
Whitaker and Baker C1291/51
(hair growth)
Cpd A (locally) Cpd B (locally)
in rat
Whitaker and Baker C1291/51
(hair growth)
(Ovariectomy + Heredity) ↑ in mouse
Houssay C2250/54 (hair growth)
Ovariectomy +ABA (anti histamine) +
Salicylate in rat
Schafer B98941/54
(healing of homotransplant)
Luteoids (locally) +ABA in rat
Prassoli C140/53 (histology)
(Testis extirpation+Heredity) ↑
in mouse
Houssay C2250/54 (hair growth)
Testis extirpation+ABA (antihistamine) +
Salicylate in rat
Schafer B98941/54
(healing of homotransplant)
Testoids+Age (senile) + Vitamin E
in man
Sabatini and Taghavini C6197/52
(histology)
Thyroidectomy thiourea in rat
del Conte and Stux C6754/54
(mast cells)
Pineal extract ↑ in frog
Bergmann B97105/54
(melanophoric activity)

Skin ← Stressors

Diseases (various)
Keech C6796/55
(collagen electronmicroscopic)
Cold, in frog
Ldgren B99652/54 (melanophores)
Cold ↑ in man
Glaser and Lee B96652/53
(sweating)

Epidermolysis bullosa ← Cortisone
Frank and Kern B97856/54
Erythema nodosum—Pathogenesis (ulcerative colitis)
Brick and Foster B99534/54
Erythema nodosum ← ACTH + Ulcerative colitis
Brick and Foster B99534/54
Erythema nodosum ← Vaccine (typhoid)
Solomon et al B99036/54
Erythroderma ← ACTH and/or cortisone
Breton et al C6142/54
(phenylbutazone)
Nairn and Anderson C6423/55
(exfoliative)
Gangrene (hemorrhagic leukemic) ← *ACTH*
Sarkano and Ransom C6364/55
Furunculosis—Pathogenesis (ACTH and/or cortisone)
Bigham C699/54
Hemodermatosis → Corticoids in urine (reducing) ← ACTH
de Gennes et al. C1921/54
Hemodermatosis → 17 KS in urine ← ACTH
de Gennes et al. C1921/54
Hemodermatosis → Eosinophils in blood ← ACTH
de Gennes et al C1921/54
Hirsutism
Atria and Medina C2318/54
(review)
Iododerma *(fungating)* ← *Cortisol*
Aquilina and Bissell C60_6/55
Keloid ← Cortisol (locally)
Criswold B97878/54
Mancini C4923/54
Leprosy ← ACTH and/or cortisone (discussion)
Anonymous C6403/55
Lichen planus ← ACTH and/or cortisone
Mestre B973_2/54 (discussion)
Lichen simplex ← Cortisol (locally)
Church C6395/55
Cochrane C3177/55
Russell et al C5363/55
Mycosis fungoides ← Cortisol (i c)
Goldman C6238/55
Neurodermatitis ← ACTH and/or cortisol
Arbesman and Richard B99511/54
Pachydermia—Pathogenesis (hypophysis)
Parsons and Cody B99873/53
Parapsoriasis ← ACTH and/or cortisone + Adrenal transplant (foetal, human)
Homburger and Bonner B97587/54
Pemphigus ← ACTH and/or cortisone
Kinsell C1364/54
Romero B97323/54 (discussion)
Pemphigus → Na/potassium ratio in skin ← ACTH
Benjamin and Cornbleet C6877/54
Pemphigus → TTH in hypophysis ← ACTH and/or cortisone
Burt and Velardo B94001/53
Pemphigus foliaceus ← ACTH and/or cortisone + Adrenal transplant (foetal human)
Homburger and Bonner B97587/54
Pemphigus vegetans ← ACTH and/or cortisone + Adrenal transplant (foetal, human)
Homburger and Bonner B97587/54
Pemphigus vulgaris ← ACTH
Ito and Inaba C3506/54
Pemphigus vulgaris ← ACTH cortisone
Robinson C5639/55
Pemphigus vulgaris → *Eosinophils* neutrophils in bullae ← ACTH
Ito and Inaba C3506/54
Prurigo (Besnier) ← ACTH (implantation)
Aron Brunetiere *B97825/53*
Pruritus ← *Cortisol (locally)*
Cochrane C3177/55
Russell et al C5363/55 (anogenital)
Turell C4780/55 (anogenital)
Pruritus ← Fluorocortisol (locally)
Turell C4780/55 (anogenital)
Psoriasis—Pathogenesis (nerves)
Ingram B98849/54
Psoriasis ← ACTH (implantation)
Aron Brunetiere B978_5/53
Psoriasis ← ACTH and/or cortisone
Callaway and Hambrick B973_5/54 (discussion)
Costello B98547/54 (pustular)
Ingram B98849/54 (discussion)
Nairn and Anderson C6423/55 (exfoliative)
Psoriasis ← Cortisol (locally)
Coldman C6_38/55
Russell et al C5363/55 (pruritic)
Psoriasis ← Rauwolfia
Leslie C6433/55
Psoriasis (arthropathica) → Psyche ← *ACTH* and/or cortisone
Fleminger C48_9/55
Quincke's edema ← ACTH + Ascorbic acid + ATP
Ravetta B99090/54
Rosacea ↓ → 17 KS in urine
Caffarena et al C2251/54
Sclerema adiposum neonatorum ← ACTH cortisone
Fauser B97871/54
Sclerema neonatorum ← Cortisone
Arellano and Songco B99903/53

Acne vulgaris Ø → 17 KS in urine
Kooy et al B96558/54
Acrosclerosis ← Cortisone
Sherter B99548/54
Watschinger C5728/54
Allergic skin diseases (various)–
Pathogenesis (adrenal medulla)
Woodward B98201/54
Allergic skin disease ← ACTH
Shulman C6226/55
Allergic skin diseases (various) ←
ACTH and/or cortisone + Age
Baer and Schwarzschild C5830/55
(discussion)
Allergic skin diseases (various) ←
Adrenaline precursor (tyrosin)
Woodard B98201/54
Allergic skin disease ← Corticoids
Nilzen B96533/53 (discussion)
Allergic skin disease ← Cortisol
Shulman C6226/55
Allergic skin disease ← Respiratory
re education
Roloff B99324/54
Alopecia ↑ → MTH in blood urine
Shizume and Lerner C416/54
Alopecia → MTH in blood, urine ←
Cortisone ↓
Shizume and Lerner C416/54
Besnier s prurigo ← ACTH and/or
cortisone
Anonymous C297/54
Besnier s prurigo ← Cortisol (locally)
Russell et al C5363/55
Cat scratch fever ← Cortisone
Schmidt B97884/54
Dermatitis–Pathogenesis
(cortisone withdrawal)
Obermayer B97867/54
Dermatitis ← ACTH and/or cortisone
Anonymous C297/54
(exfoliative)
Curtis C631/54 (allergic)
Nilzen B96533/53 (atopic)
Pounders C1455/54
(atopic–discussion)
Rhodes B97202/54 (plant)
Dermatitis ← Cortisone
Obermayer B97867/54
Schwartz B96495/53
(contact experimental)
Dermatitis ← ACTH and/or cortisone +
Adrenal transplant
(foetal human)
Homburger and Bonner B97587/54
(atopic seborrhoic)
Dermatitis ← Cortisol (locally)
Church C3695/55 (contact)
C5599/55
Cochrane C3177/55 (atopic)
Curtis C631/54 (atopic)
Rhodes B97202/54 (plant)

Russell et al C5363/55
(idiopathic)
Dermatitis (atopic venenata seborrhoic
stasis) ← Cortisol (locally) +
Antibiotic (locally)
Robinson et al C3525/55
Dermatitis ← Δ cortisone
Robinson C5609/55
(atopic exfoliative)
Dermatitis → Resistance ← Cortisone +
Antibiotic
Phillips et al C3526/55
(exfoliative)
Dermatitis → Heart ← Cortisone
+ *Antibiotic*
Phillips et al C3526/55
(exfoliative)
Dermatomyositis–Pathogenesis (G A S)
Bohrod C3404/55
Dermatomyositis ← ACTH and/or
cortisone
Aballi B97285/54 (discussion)
Asboe-Hansen B633/54
(discussion)
Baehr and Levitt B97171/54
(review)
Caldwell C6429/55 (discussion)
Kinsell C1364/54
Smith C6053/55 (discussion)
Dermatomyositis → Adrenals (histology)
Smith C6053/55
Dermatosis ← Cortisol (locally)
Hopkins C5372/55 (discussion)
Dermatosis ← 9α fluorocortisol
(systemically locally)
Robinson C5615/55
Eczema ← ACTH and/or cortisone
Anonymous C297/54
Aron Brunetiere B97625/53
Overall C1456/54
(atopic–discussion)
Eczema ← ACTH and/or cortisone +
Age (childhood)
Collins Williams C4523/55
Eczema (infantile) ← Cortisone + Diet
O Keefe C1019/54
Eczema ← Cortisol (locally)
Anonymous B98491/54
Church C5599/55 C6595/55
(atopic nummular)
Cochrane C3177/55
Lewis B98496/54 (housewife s)
Overall C1456/54 (atopic–
discussion)
Paulsen and Loland C679/54
Russell et al C5363/55
Sidi and Bourgeois Gavardin
B97841/54 (diabetic infantile)
Warin C6053/55 (discussion)
Eczema ← Cortisol (locally) +
Antibiotic (locally)
Robinson et al C3525/55
(perianal of vulva)

SENSE ORGANS

(For earlier pertinent data cf also *Stress* pp 680-687 AROS 1951 pp 396-402 AROS 1952 pp 256-269 AROS 1953 pp 320-340 AROS 1954 pp 482-485)

Eye ← Various

Hypophysectomy ↓ in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Hypophysectomy + ACTH Ø in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Hypophysectomy + STH ↑ TTH ↑ in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Hypophysectomy + Cortisone Ø in rat
Aterman and Greenberg B99032/54
(exophthalmos)
Greenberg and Aterman B99025/54
(exophthalmos)

Hypophysectomy + Cortisone ↑ in rat
Greenberg and Aterman B99025/54
(eye balls weight/body weight)

Hypophysectomy + Folliculoids Ø in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Hypophysectomy + Thyroxin ↑ in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Hypophysectomy ↑ + Age (immature) in rat
Essex C6308/55 (exophthalmos)

Hypophyseal anterior lobe extract + ACTH ↑ + Thyroidectomy in guinea pig
Smelser and Ozanics B98922/54
(exophthalmos)

Hypophyseal anterior lobe extract ↑ + Thyroidectomy in guinea pig
Smelser and Ozanics B98922/54
(exophthalmos)

ACTH ↑ + TTH in guinea pig
Aterman B96732/54
(exophthalmos)

ACTH + Adrenaline noradrenaline in rat
von Sallmann et al C1070/54
(eye pressure)

ACTH Ø + Thyroidectomy in guinea pig
Smelser and Ozanics B98922/54
(exophthalmos)

ACTH + Acetylcholine in rat
von Sallmann et al C1070/54
(eye pressure)

STH in rat
Essex C6308/55
(growth–discussion)

STH Ø + Thyroidectomy in guinea pig
Smelser and Ozanics B98922/54
(exophthalmos)

STH Ø + Thyroidectomy in rat
Boas and Bates B99014/54
(Harderian gland–weight)

GTH Ø + Thyroidectomy in guinea pig
Smelser and Ozanics B98922/54
(exophthalmos)

TTH in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cortisone ↑ in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cortisone (locally) Ø in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cortisone + Thyroidectomy ↑ in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cortisone ↑ + Thyroidectomy in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cortisone + Thyroidectomy + Thyroxin in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Cpd A ↑ in guinea pig
Aterman B96732/54
(exophthalmos)

TTH ↑ + Thyroidectomy in guinea pig
Aterman B96732/54
(exophthalmos)

TTH + Thyroidectomy in rat
Sforzini C3236/53 (orbital fat)

TTH + Ascorbic acid Ø in guinea pig
Aterman B96732/54
(exophthalmos)

MTH ↑ in frog and toad
Hanaoka B97088/53
(regeneration of visual purple)

MTH ↑ in man
Hanaoka B97089/51
(dark adaptation light sensitivity)

Vasopressin + Noradrenaline in rat
von Sallmann et al C1070/54
(eye pressure)

Adrenalectomy Ø in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Adrenalectomy + Cortisone in mouse
Naguib and Robson C4504/55
(tuberculosis)

Adrenalectomy + Cortisone in rat
Boas and Bates B99014/54
(Harderian gland–weight)

Adrenalectomy + DOCA, in mouse
Naguib and Robson C4504/55
(tuberculosis)

Scleroderma—Pathogenesis
Bohrod C3401/55 (G-A S)
Reiman and Bilo C1764/53
(hypophysis)

Scleroderma ← ACTH and/or cortisone
Asboe Hansen C833/54
(discussion)
Baehr and Levitt B97171/54
(review)
Bauer and Conn B98457/53
(*with cataract Werner s* syndrome)
Glaser and Smith B96458/53
Kinsell C1364/54
Richards B98841/54
Ros B97286/54
Sperling B97883/54 (discussion)
Volpe and Hauch C3866/55
Weiss B98023/53
Zarafonetis B98550/54

Scleroderma (with cataract Werner s syndrome) → F Cs 17 KS in urine
Bauer and Conn B98457/53

Scleroderma (with cataract Werner s syndrome) → 17 KS in urine ← Desoxocortisone
Bauer and Conn B98457/53

Scleroderma → Blood flow (digital) ← Cortisone
Catchpole et al C1563/54

Scleroderma → Blood pressure ← ACTH ↑
Bagnall and Robinson B99524/54

Sezary s syndrome ← ACTH and/or cortisone
Alderson et al *C6376/55*

Thibierge Weissenbach s syndrome ← Cortisol (locally)
Jaffres C5725/54
(type of Scleroderma)

Ulceration—Pathogenesis (noradrenaline)
Urecchio et al B96471/53

Urticaria—Pathogenesis
(ACTH and/or cortisone)
Coste et al B96534/53

Urticaria ← ACTH and/or cortisone
Arbesman and Richard B99511/54
Canseco and Salinas B99189/53
Coste et al B96534/53
Kolbl and Wolf C739/54 (cold)
Nilzen B96533/53
Sangiorgi C6191/54
Sheldon et al C4025/54
(discussion)
Steinhardt C4023/54

Urticaria ← ACTH and/or cortisone + Age (childhood)
Collins Williams C4523/55

Urticaria ← *ACTH* + Ascorbic acid + ATP
Ravetta B99090/54

Urticaria ← Cortisol
Arbesman and Richard B99511/54
Nilzen B96533/53

Various cutaneous diseases ← ACTH and/or cortisone
de Castro and Viegas C4133/53
Goldman C3613/55
(chlorpromazine)
Sahu C5597/55 (discussion)

Various *cutaneous* diseases ← Corticoids
Goldman et al C684/54
(use after preliminary assay)

Various cutaneous diseases ← Cortisol (locally)
Hellier C6048/55 (discussion)
Kalz et al. *C704/55*
Kile C694/54
Sofen C1555/54
Sulzberger C6247/55
Witten C6239/55 *(discussion)*

Various cutaneous diseases ← 9α fluorocortisol (locally)
Sulzberger C6247/55

Vitiligo ← ACTH
Thompson and Donoso C2224/54

Vitiligo ↓ → Na in blood
Thompson and Donoso C2224/54

Vitiligo Ø → Potassium in blood
Thompson and Donoso C2224/54

Vitiligo Ø → Corticoids in urine
Thompson and Donoso C2224/54

Vitiligo ↓ → 17 KS in urine
Thompson and Donoso C2224/54

HIBERNATING GLAND

(For earlier pertinent data cf also *Stress* pp 740 741 AROS 1951 p 433 AROS 1952 p 276 AROS 1953 p 346 AROS 1954 p 499)

Hibernating Gland ← Various

Cortisone ↑ in hamster
Shwartzman B98275/54 (weight)

Cortisone + Age (senile) ↓ in hamster
Shwartzman B98275/54 *(weight)*

Cortisone + Poliomyelitis in hamster
Shwartzman B98275/54
(histology)

Cortisone + Poliomyelitis in monkey
Shwartzman and Aronson
B98157/54 (histology poliomyelitis virus content)

Ocular Diseases

Blepharitis ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55
Blindness ♂ → 17 KS in urine
Wassner C4858/54
Cataract—Pathogenesis (G-A S)
Grom and Rodriguez B98649/54
Chalazion ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55
Choroiditis ← Cortisone
Jacobius and Grandi B99562/54
Conjunctivitis—Pathogenesis (G-A S)
Grom and Rodriguez B98649/54
Conjunctivitis (allergic) ← Cortisone (locally)
Braley C5440/54
Foulds et al C1785/55
Conjunctivitis (allergic) ← Cortisol (locally)
Foulds et al C1785/55
Conjunctivitis ← Cortisol (locally) + Antibiotic
LaGrange C3528/55
Conjunctivitis ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55
Conjunctivitis ← 9 fluorocortisol (locally)
Gordon C5521/55
Conjunctivitis (allergic) → Eosinophils in conjunctival smear ← Adrenaline (locally) Cortisone (locally) ↓
Hanser B98913/54
Corneal ulcer ← Cortisone cortisol (locally)
Braley C5440/54
Duhring Brocq's disease ← ACTH (implantation)
Aron Brunetiere B97825/53
Endophthalmitis (postoperative) ← Cortisone + Antibiotic
Lipsius B97855/54
Episcleritis ← Cortisone (locally by iontophoresis)
Berrettini C646/53
Episcleritis ← Cortisone (locally)
Cross B98511/54
Exophthalmos
Sforzini C3238/54 (review)
Exophthalmos—Pathogenesis
Aterman B96732/54 (adrenals G A S)
Grom and Rodriguez B98649/54 (G A S)
Szentagothai and Schab C2144/54 (nerves)
Exophthalmos ← Hypophyseal irradiation (ionizing rays)
Aterman B96732/54 (discussion)
Gedda and Lindgren C3002/54
Wijnbladh et al C817/54
Exophthalmos ← ACTH and/or cortisone
Anonymous C946/55
Decourt et al C1928/54
Fromm et al B97575/54
Exophthalmos ← Cortisol
Decourt et al C1928/54
Exophthalmos ← Cortisol (locally)
Arnalou et al B99814/54
Exophthalmos ← Thyroxin
Aterman B96732/54
Exophthalmos → 17 KS in urine
Fromm et al B97575/54
Exophthalmos → Connective tissue
Iversen C823/54 (discussion)
Extraocular trauma ← Trypsin
Hopen C5846/54
Glaucoma—Pathogenesis (G-A S)
Grom and Rodriguez B98649/54
Herpes ophthalmicus—Pathogenesis (G A S)
Grom and Rodriguez B98649/54
Hordeolum ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55
Iridocyclitis ← Cortisone (systemically locally) + ABA (atropine)
Fink B98513 54
Iritis ← ACTH + Cortisone (systemically and locally)
Yanes B97326/54 (discussion)
Iritis ← Cortisone (locally)
Holland and Lepisto B99528/54 (postoperative)
Keratitis ← Cortisone (locally)
Braley C5440/54
Holland and Lepisto B99528/54 (striped)
Keratitis (interstitial syphilitic) ← Cortisone (locally)
Horne B99998/54 C5035/55 (review)
Ryan B98512/54
Keratoconjunctivitis sicca (rheumatic) ← ACTH and/or cortisone
Appelmans et al B98969/54
B93057/51
Macular disease ← ACTH and/or cortisone
Bain C645/54
Ophthalmia (sympathetic)—Pathogenesis (G-A S)
Grom and Rodriguez B98649/54
Ophthalmia (sympathetic) ← Cortisone (locally systemically) + ABA (atropine)
Fink B98513/54
Optic atrophy (syphilitic) ← ACTH and/or cortisone + Antibiotic
Klauder and Cross B97657/54

Adrenaline ↑+Anesthetic (locally) in rabbit
Charonnat and Lechat B99808/53 (corneal anesthesia)
Cortisone Ø in guinea pig
Aterman B96732/54 (exophthalmos)
Cortisone (locally) Ø in man
Colombi B99530/54 (ocular tonus)
Cortisone Ø in rat
Boas and Scow B96567/54 (mass of orbital tissue growth of eyeball)
Cortisone ↑ in rat
Aterman and Greenberg B99532/54 (exophthalmos)
Boas and Scow B96567/54 (*exophthalmos*)
Cortisone+Thyroxin ↓ in rat
Aterman and Greenberg B99532/54 (exophthalmos)
Cortisone+Age (newborn) in rat
Field C4642/54 (exophthalmos)
Cortisone ↑+Age (immature) in rat
Essex C6308/55 (exophthalmos)
Thyroidectomy Ø in guinea pig
Aterman B96732/54 (exophthalmos)
Thyroidectomy ↑ in guinea pig
de Poli and Martini C4221/54 (exophthalmos)
Thyroidectomy Ø in rat
Boas and Scow B96567/54 (mass of orbital tissue growth of eyeball)
Thyroidectomy ↓ in rat
Boas and Bates B99014/54 (Harderian gland—weight)
Thyroidectomy ↑ in rat
Boas and Scow B96567/54 (exophthalmos)
Thyroidectomy +Phenylbutazone ↓ in guinea pig
de Poli and Martini C4221/54 (exophthalmos)
Thyroidectomy +Vitamin B_1 ↓ in guinea pig
de Poli and Martini C4221/54 (exophthalmos)
Trauma Ø in rat
Boas and Bates B99014/54 (Harderian gland—weight)
Mammectomy+Mammary gland transplant in spleen in rat
Lacour et al B96714/53 (exophthalmos)
ABA (chlorpromazine) ↑+Anesthetic (locally) in rabbit
Charonnat and Lechat B99808/53 (*corneal anesthesia*)

Anesthetic (locally)+Salicylates ↑ in rabbit
Charonnat and Lechat B99808/53 (corneal anesthesia)
Hyaluronidase (locally) in guinea pig
Aterman B96732/54 (*exophthalmos*)

Topical Irritation of the Eye

[*The causative agent is indicated in* brackets e g (burns) means topical irritation elicited by the application of burns to the eye]

Topical Irritation of the Eye ← Various

ACTH in rabbit
Bunn and Robinson B97864/54 (tuberculosis)
STH Ø in rabbit
Bunn and Robinson B98489/54 (tuberculosis)
Cortisone Ø in rabbit
Bocci C1510/53 (tuberculin reaction)
Cortisone (locally) in rabbit
Yasuna et al B97858/54 (wound healing)
Cortisone+Antibiotic in mouse
Naguib and Robson C4504/55 (*tuberculosis*)
Cortisone+Sulfone derivatives in rabbit
Beverley et al B99893/54 (iritis after toxoplasma)
DOCA in mouse
Naguib and Robson C4504/55 (tuberculosis)
Thyroidectomy Ø in rat
Smelser and Ozanics B96885/54 (epithelization after burns to cornea)
(Thyroidectomy+Colchicine) Ø in rat
Smelser and Ozanics B96885 54 (number of mitotic figures after burns to cornea)
Thyroxin ↓ in rat
Smelser and Ozanics B96885/54 (epithelization after burns to cornea)
(Thyroxin+Colchicine) ↓ in rat
Smelser and Ozanics B96885/54 (number of mitotic figures after *burns to cornea*)
Serologic reactions (immunization) in rabbit
Shikano B97692/52 (*E coli*)

Ocular Diseases

Blepharitis ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55

Blindness O → 17 KS in urine
Wassner C4568/54

Cataract—Pathogenesis (G A S)
Grom and Rodriguez B98649/54

Chalazion ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55

Choroiditis ← Cortisone
Jacobius and Grandi B99562/54

Conjunctivitis—Pathogenesis (G-A S)
Grom and Rodriguez B98649/54

Conjunctivitis (allergic) ← Cortisone (locally)
Braley C5440/54
Foulds et al C1765/55

Conjunctivitis (allergic) ← Cortisol (locally)
Foulds et al C1765/55

Conjunctivitis ← Cortisol (locally) + Antibiotic
LaGrange C3528/55

Conjunctivitis ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527/55

Conjunctivitis ← 9α fluorocortisol (locally)
Gordon C3521/55

Conjunctivitis (allergic) → Eosinophils in conjunctival smear ← Adrenaline (locally) Cortisone (locally) ↓
Hanser B98913/54

Corneal ulcer ← Cortisone cortisol (locally)
Braley C5440/54

Duhring Brocq's disease ← ACTH (implantation)
Aron Brunetiere B97825/53

Endophthalmitis (postoperative) ← Cortisone + Antibiotic
Lipsius B97855/54

Episcleritis ← Cortisone (locally by iontophoresis)
Berrettini C646/53

Episcleritis ← Cortisone (locally)
Cross B98511/54

Exophthalmos
Sforzini C3238/54 (review)

Exophthalmos—Pathogenesis
Aterman B96732/54 (adrenals G-A S)
Grom and Rodriguez B98649/54 (G-A S)
Szentágothai and Schab C2144/54 (nerves)

Exophthalmos ← Hypophyseal irradiation (ionizing rays)
Aterman B96732/54 (discussion)
Gedda and Lindgren C5002/54
Wynd Lidh et al C817 54

Exophthalmos ← ACTH and/or cortisone
Anonymous C946 55
Decourt et al C1925 54
Fromm et al B97575 54

Exophthalmos ← Cortisol
Decourt et al C1925 54

Exophthalmos ← Cortisol (locally)
Venalon et al B99614 54

Exophthalmos ← Thyroxin
Aterman B96732 54

Exophthalmos → 17 KS in urine
Fromm et al B97575/54

Exophthalmos → Connective tissue
Eversen C823 54 (discussion)

Extraocular trauma ← Trypsin
Hop n C5646 54

Glaucoma—Pathogenesis (G A S)
Grom and Rodriguez B98649/54

Herpes ophthalmicus—Pathogenesis (G A S)
Grom and Rodriguez B98649 54

Hordeolum ← Cortisol (locally) + Antibiotic (locally)
Nedlinger and Hudson C3527 55

Iridocyclitis ← Cortisone (systemically locally) + ABA (atropine)
Fink B98513 54

Iritis ← ACTH + Cortisone (systemically and locally)
Yanes B97326 54 (discussion)

Iritis ← Cortisone (locally)
Holland and Lepisto B99558/54 (postoperative)

Keratitis ← Cortisone (locally)
Braley C5440/54
Holland and Lepisto B99558/54 (strip d)

Keratitis (interstitial syphilitic) ← Cortisone (locally)
Horne B99995 54 C5035/55 (review)
Ryan B3851/54

Keratoconjunctivitis sicca (rheumatic) ← ACTH and/or cortisone
Appelmans et al B96969/54
B99057 54

Macular disease ← ACTH and/or cortisone
Bain C645/54

Ophthalmia (sympathetic)—Pathogenesis (G A S)
Grom and Rodriguez B98649/54

Ophthalmia (sympathetic) ← Cortisone (locally systemically) + ABA (atropine)
Fink B98513/54

Optic atrophy (syphilitic) ← ACTH and/or cortisone + Antibiotic
Klauder and Gross B97857/54

Phlyctenulosis ← Cortisone (locally by iontophoresis)
Berrettini C616/53
Pinguecula ← Cortisone (locally)
Appelmans and Hendrichs B99059/54
Retinal hemorrhage ← ACTH and/or cortisone
Sacca B99521/54 (arteriosclerotic)
Retinopathy (diabetic)–Pathogenesis
Becker et al B97145/54 (adrenals pantothenic acid vitamin B_{12})
Grom and Rodriguez B98649/54 (G A S)
Retinopathy (hypertensive)–Pathogenesis (G-A S)
Grom and Rodriguez B98649/54
Retrolental fibroplasia–Pathogenesis (G A S)
Grom and Rodriguez B98649/54
Tuberculosis ← ACTH and/or cortisone
Woods B98514/54 (discussion)
Tuberculosis ← Cortisol
Woods B98514/54 (discussion)
Uveitis–Pathogenesis (G A S)
Berrettini C4178/54
Uveitis ← Cortisone (locally by iontophoresis)
Berrettini C646/53
Uveitis ← Cortisone (locally)
Michaud and Forestier C5776/54 (spondylarthritis)
Various corneal diseases ← Cortisone (locally)
Anonymous B98510/54 (discussion)
Various ocular diseases ← ACTH and/or cortisone
Gordon C3521/55
Jess C1339/52 (rheumatic–discussion)
Wolfson C3463/54
Various ocular diseases ← Cortisol (locally)
Gordon C3521/55 C6241/55
Steffensen C6242/55
Various ocular diseases ← Trypsin
Campagna and Hopen C5645/55
Hopen C5649/54
Hopen and Campagna C5647/54

Nose

Nose ← Various

Cortisone in guinea pig
Businco B99102/54 (mucosa)
Cortisone in rabbit
Businco B99102/54 (mucosa)
Businco et al B98905/54 (mucopolysaccharides in mucosa)
Cortisone ↑ in rabbit
Businco et al B99101/54 (leucocytes in mucosa)

Diseases of the Nose

Ecchymosis ← Cortisone
Gidoll B99523/54 (postoperative)
Edema ← Cortisone
Gidoll B99523/54 (postoperative)
Ozaena ← Cortisone
Rosen and Feldman B98505/53
Ozaena ← Pregnancy
Rosen and Feldman B98505/53
Rhinitis (allergic)–Pathogenesis
Salerno C4745/54 (thyroid)
Woodward B98201/54 (adrenal medulla)
Rhinitis (allergic) ← ACTH and/or cortisone (locally or systemically)
Arbesman and Richard B99511/54
Bormioli B98914/54
Businco et al B98905/54 (mucopolysaccharides in mucosa) B99101/54 (histology of mucosa)
Evans B98915/54
Rose B97172/54 (discussion)
Singiorgi C6191/54
Stewart and Kawa B98497/54
Rhinitis (allergic) ← ACTH and/or cortisone+Age (childhood)
Collins Williams C4523/55
Rhinitis (allergic) ← Adrenaline precursor (tyrosin)
Woodward B98201/54
Rhinitis (allergic) ← Cortisol
Arbesman and Richard B99511/54
Traynor et al B97842/54
Rhinitis (allergic) ← Cortisol (locally)
Foulds et al C1785/55
Ogden et al C3858/55
Smith B97849/54
Tuft C4018/54
Willhot and Cuche C3302/55
Rhinitis (allergic) ← Cortisol (free alcohol locally)
Pennypacker C4021/54
Rhinitis (allergic) ← Cortisol (free alcohol locally)
Silcox C641/54
Rhinitis (nonallergic) ← Cortisol (free alcohol locally)
Silcox C641/54
Rhinitis (vasomotor) ← Cortisol (locally)
Burger and Shaffer C6243/55
Rhinitis (allergic) → Histamine (free) in urine ← *Cortisone ↑*
Mitchell et al C4026/54

Rhinitis (allergic with provoked attack) → Eosinophils in blood ← ACTH
Teseo et al. C3035/54
Rhinitis (allergic) → Nose (histology of mucosa) ← Cortisone
Businco et al. B99101/54

Ear

Diseases of the Ear

Deafness ↑ → Eosinophils in blood ← Diurnal variations
Feldman et al B99579/54
Otitis externa ← Cortisol (locally)
Russell et al C5563/55
Senturia et al. C6240/55
Otitis ← Cortisol (locally) + Antibiotic
LaGrange C5528/55
Otosclerosis ← Hypophysis irradiation (ionizing rays)
Fowler C5066/46
Otosclerosis → 11 oxycorticoids in urine
Cassano C2093/53
Otosclerosis ↑ → 17 KS in urine
Cassano C2093/53
Otosclerosis → Blood count ← ACTH
Cassano C2093/53 (eosinophils)

CONNECTIVE TISSUE AND INFLAMMATION

(Including data on inflammation wound healing spreading capillary permeability local allergic reactions connective tissue cells in vitro and phagocytes For other pertinent data cf also Skin and "Serologic Reactions pp 509-514 and 537 539 in this volume and *Stress* pp 747 751 AROS 1951 pp 435 453 AROS 1952 pp 281 290 AROS 1953 pp 347 346 AROS 1954 pp 500 514)

After the section Generalities this chapter has been subdivided into Connective Tissue and Inflammation depending on whether the target has been studied as such or after some specifically mentioned irritation Thus some targets (e g spreading capillary permeability) can appear under both headings while other (e g anaphylactoid inflammation after systemic application of various substances or tuberculin reaction) will be found only in one of these sections

Reviews on connective tissue
Ange ne B96610/50
Bak r and Abrams C3427/55
Bennett B96687/50
(fibrinoid degeneration of
t c tissue—discussion)
nd Viola C256/54
C 1405/54 (structure)
B97055/54
B97986/53
n B96546/53 (ground
ce in guinea pig)
Smith C820/54
on C830/54 (connective
nd carcinoma)
t C828/54 (connective
nd infection)
s authors B91197/50
54 C1753/54
inflammation
k C1079/49
l os C6554/55
rey B96555/54 B96856/54
1056_/54 (wound healing)
es C825/54 (wound healing)
nonde C310/54 (infections)
Lustig and Sacerdote C2653/54
wound healing in vitro)
R daelli C1192/55 (infection and inflammation)
Heussing C1008/54
(definition of inflammation)
Selye C3449/54
Ware C5865/54 (history of inflammation)
Yakovleva B98007/53 (wound healing in mouse—review)
Zironi C3/54 C1059/55
C1060/ND
Anaphylactoid reactions
Jasmin C1453/55
Jasmin and Selye C3470/55
McMaster et al. C3983/54
(in mouse)
Moeller C4001/55 (in man)
Leucocytes
Busse Grawitz C3979/54
(generalities role of leucocytes)
McCutcheon C3412/55
(chemotaxis locomotion of leucocytes)
Rebuck and Crowley C3416/55
(role of leucocytes leucocyte function in vivo)
Richter C3419/55 (secretory activity of leucocytes)
Sieracki C3413/55
(neutrophilic leucocytes—review)
Various authors C3411/55
(leucocytic function—review)
Wilson B96693/53 (egestion of phagocytized particles by leucocytes)
Mast cells
Asboe Hansen C1756/54
Koksal C1302/53 (review)
Mota C2795/54
(basophils)

Riley and West B96668/53 (histamine in mast cells—discussion)
Sannazzari and Visioli B96441/53 (transformation of fibroblasts into *mast cells*)

Physico chemical data
Albert Weil and Murat B97103/54 (role of proteolysis)
Bennett and Beeson C2402/53 (*pyrogens from leucocytes* and exudates)
Gorkin C5/53 (necrosin hemolysin—chemistry)
Gross C1403/54 (chemistry *of connective tissue*)
Hara B97679/52 (leucocytosis-promoting and leucopenic factors in cancer)
Hewitt B96384/54 (dispersion of *injected substances as related to* their particle size and other factors)
McManus C821/54 (histochemistry of connective *tissue*)
Menkin C3425/55 (leukotaxine local migration of leucocytes in inflammation leucocytosis promoting factor local *pH changes*)
Meyer B96658/50 (chemistry of connective tissue polysaccharides—discussion) C622/54 C1402/54 (chemistry *of connective tissue*)
Moon and Tarshakovic C4282/54 (phlogistic mediators)
Various authors B92423/53 (nature and structure of collagen—review)

Transformation of cells
Chutna C5471/54 (transformation of histiocytes into fibroblasts in wound healing)
Loreto C15/53 (dedifferentiation of adult cell elements to primitive indifferent mesenchymal cells)
Oboshi B97982/53 (transformation of monocytes to lymphoid cells in vitro) B97983/53 (transformation of lymphocytes to monocytoid and plasmacytoid cells in vitro)
Sannazzari and Visioli B96444/53 (transformation of fibroblasts into mast cells)

Other data
Albert Weil C1331/54 (significance of anti inflammatory drugs)
Busse-Grawitz B99334/54 (origin of pus in *peritonitis*)
Feldberg B99492/54 (histamine—review)
Florey B96857/54 (chemotaxis phagocytosis and the formation of abscesses) B96858/54 (the RES the omentum lymphatic drainage the lymphocyte) B96859/54 (inflammation of mucous membranes)
French and Benditt B98078/54 (role of alkaline phosphatase)
Fujimaki C1004/54 (granuloma and serologic reactions)
Hermann B96356/53 (role of nerves)
Kahn B95821/54 (role of immunologic localizing response)
Kallos C4123/55 (inflammation and serology)
Letterer C2 54 (discussion)
Lobitz and Holyoke B96692/54 (glycogen in skin during wound *healing*)
Miyakawa et al B97655/52 (wandering cells in germ free guinea pig)
Rindani B97840/54 (granuloma pouch technique)
Rosenthal et al C5144/55 (granuloma pouch for study of burns in rat)
Speirs C3414/55 (basophils eosinophils—review)
Sundberg C3412/55 (lymphocytes and plasma cell)
Tompkins C3415/55 (monocytes—review)
Ueno et al B97668/52 (skin and mucosa in dog and rabbit)
Vikhert B96397/53 (definition of RES)
Wright and Dodd C3423/55 (phagocytosis)
Ziff et al C9_5/55 (aminotripeptidase in synovial fluid as index of the status of inflammation)
Zweifach C1754/54 (capillary permeability exchange of materials between vessels and lymph)

Connective Tissue ← Stimuli (Systemic)

Hypophysectomy Ø in hamster
Smith and Lewis C4564/55 (mast cells in skin mesentery cheek pouch)
Hypophysectomy in rat
Gordon B98602/54 (eosinophils in peritoneal fluid)
Hypophysectomy + ACTH in rat
Smith and Lewis C1168/54 (mast cells in skin mesentery)

Hypophysectomy + STH ↑ in rat
Boas and Foley B99647/54
(weight of orbital connective tissue)
Hypophysectomy + Ionizing rays in rat
Smith and Lewis C1168/54
(mast cells in skin mesentery)
Hypophysectomy + Dextran + Trypsin ↓ in rat
Cohen et al C4552/55
(anaphylactoid inflammation)
Hypophyseal extract
Ozeki C33_9 55
(opsonic index of leucocytes in vivo)
Hypophyseal anterior lobe extract in rabbit
Yamagata et al C5967/55 (RES)
Hypophyseal anterior lobe extract + Anesthetic (barbiturate) in rabbit
Yamagata et al C5967/55 (RES)
ACTH
Albrecht B98166/54
(movement of leucocytes in vitro growth of fibroblasts in vitro)
Gross C4614/54 (eosinophils in various tissues discussion)
Mahaux B97085/54 (spreading review)
Moeschlin B98167/54 (movement of leucocytes phagocytosis—discussion)
Moeschlin et al B99333/53
(phagocytosis in vitro)
ACTH ↓ in dog
Frimmer and Pfleger B99845/54
(RES clearance)
ACTH in hamster
Smith and Lewis C4564/55 (mast cells in skin mesentery cheek pouch)
ACTH in rabbit
Crabbe B99637/54
(macrophages phagocytosis in vitro)
Yamagata et al C5967/55 (RES)
ACTH (to rabbit) ↓
Crabbe C2841/55 (macrophage phagocytosis in vitro)
Moeschlin et al B99333/53
(phagocytosis)
ACTH + Adrenalectomy in rat
Smith and Lewis C1168/54
(mast cells in skin mesentery)
ACTH Ø + Adrenalectomy + DOCA in hamster
Smith and Lewis C4564/55
(mast cells in skin mesentery cheek pouch)
ACTH + Cortisone in guinea pig
Gross C4615/54
(eosinophils in various tissues)
ACTH Ø + Egg albumin in rat
Hillebrecht B99128/54
(anaphylactoid reaction)
ACTH ↓ + Egg albumen in rat
van Cauwenberge et al B98320/53
(anaphylactoid reaction)
STH
Iversen C823/54 (discussion)
STH in mouse
Asadi et al C2623/54 (histology)
STH + Age (embryonic) in fowl
Fell C4238/55 (various in vitro)
GTH in rabbit
Yamagata et al C5967/55 (RES)
TTH
Asboe Hansen C1756/54
(fat tissues—discussion)
Iversen C823/54 (discussion)
TTH in guinea pig
Dina et al C6088/55 (spreading)
TTH + Thyroidectomy in guinea pig
Dina et al C6088/55 (spreading)
Hypophyseal posterior lobe extract in rabbit
Yamagata et al C5967/55 (RES)
Adrenalectomy
Mahaux B97085/54
(spreading—review)
Adrenalectomy in rat
Gordon B98602/54
(eosinophils in peritoneal fluid)
Adrenalectomy + Cortisol + DOCA + Nephrectomy + Dextran in rat
Selye C4119/55
(anaphylactoid reaction)
(Adrenalectomy + DOCA) Ø in hamster
Smith and Lewis C4564/55
(mast cells in skin mesentery cheek pouch)
Adrenalectomy + Heat + Humidity + Nerves (psychiatric stress) in rat
Clay and Nelson B99484/54
(spreading)
Adrenalectomy + Ionizing rays in rat
Smith and Lewis C1168/54
(mast cells in skin mesentery)
Adrenalectomy + Dextran + Trypsin ↓ in rat
Cohen et al C4552/55
(anaphylactoid reaction)
Adrenalectomy + Egg albumin + Salicylate Ø in rat
van Cauwenberge et al B98320/53
(anaphylactoid reaction)
Adrenalectomy + Hyaluronidase in mouse
Asadi et al C_623/54 (histology)
(Adrenalectomy + NaCl) Ø in hamster
Smith and Lewis C4564/55
(mast cells in skin mesentery cheek pouch)
Adrenalectomy + Stressors in mouse
Asadi et al C2623/54
(histology)

Adrenaline
Ozeki C3329/53 (opsonic index of leucocytes in vivo)
ACL
Ozeki C3329/53 (opsonic index of leucocytes in vivo)
ACE in rabbit
Yamagata et al C5907/55 (RES)
Corticoids
Baker and Abrams C3427/55 (review)
Dunn C2668/54 (reticular–review)
Iversen C823/54 (review)
Mahaux B97085/54 (spreading–review)
Cortisone
Cross C4614/54 (eosinophils in various tissues–discussion)
Hartmann C2416/54 (formation of amniotic adhesions in vitro)
Moeschlin B98167/54 (movement of leucocytes phagocytosis–discussion)
Moeschlin et al B99339/53 (phagocytosis in vitro)
Cortisone ↓
de Lustig and Sacerdote B97568/53 (migration and mitosis of fibroblasts and fibrillogenesis in vitro)
Cortisone ↓ in dog
Frimmer and Pfleger B99845/54 (RES clearance)
Cortisone ↓ in fowl
Lustig C203/53 (fibrillogenesis in vitro)
Cortisone in hamster
Smith and Lewis C4564/55 (mast cells in skin mesentery cheek pouch)
Cortisone in man
Asboe Hansen C1756/54 (mast cells)
Martin et al C3617/55 (leucocyte metabolism)
Cortisone Ø in man
Baer et al C4609/55 (eosinophils phagocytosis in vitro)
Gross et al C3095/54 (eosinophils in vitro)
Cortisone (hemisuccinate) ↓ in man
Cortes et al C3922/53 (eosinophils in vitro)
Cortisone in mouse
Cyr et al C5331/55 (phagocytes)
Cortisone ↓ in mouse
Heller C730/55 (phagocytosis of RES)
Cortisone in rabbit
Crabbe B99637/54 (macrophages phagocytosis in vitro)
Cortisone (overdosage) in rabbit
Bracali and Spigoloni C2017/53 (RES)
Cortisone ↓ in rabbit
Crabbe C122/53 (leucocytes phagocytosis in vitro)
C2832/55 (macrophages phagocytosis in vitro)
Moeschlin et al B99333/53 (phagocytosis)
Cortisone in rat
Cresseri and Meli C523/53 (spreading)
Devitt et al B96691/54 (mast cells)
Romani C672/53 (mast cells)
Smith and Lewis C1168/54 (mast cells in skin mesentery)
Cortisone ↓ in rat
Heller C730/55 (phagocytosis of RES)
Gordon B98602/54 (eosinophils in peritoneal fluid)
Cortisone (locally) + Diseases (various) in man
Benjamin and Cornbleet C4815/54 (spreading)
Cortisone (to rabbit) + Serum (bovine to monocytes)
Hayashi et al C6086/55 (monocytes in vitro from bovine serum pretreated rabbit)
Cortisone + Amino acid ↑ in rabbit
Vaccaro C3812/54 (phagocytosis in blood)
Cortisone + Choline in mouse
Heller C5194/55 (RES)
Cortisone + Egg albumin, in rat
Hillebrecht B99128/54 (anaphylactoid reaction)
Cortisone ↓ + Egg albumin in rat
van Cauwenberge et al B95320/53 (anaphylactoid reaction)
Cortisone + Potassium polyphosphate radioactive in dog
Frimmer and Pfleger P98902/54 (RES clearance)
Cortisol Ø
Menkin C447/54 (activity of leucocytosis promoting factor in vitro)
Cortisol in man
Baer et al C4609/55 (eosinophils phagocytosis in vitro)
Martin et al C3617/55 (leucocytes metabolism)
Cortisol, in mouse
Asadi et al C2623/54 (histology)
Dougherty and Schneebeli C5934/55 (fibroblasts ground substance)
Cortisol in rat
Romani C672/53 (mast cells)

Cortisol+Diseases (various)
in man
Benjamin and Cornbleet C4815/54
(spreading)
Cortisol+Antiserum in fowl
Latta and Kutsakis C5309/55
(embryo heart fibroblasts in vitro)
DOC in mouse
Asadi et al C2623/54 (histology)
DOCA in dog
Frimmer and Pfleger B99845/54
(RES clearance)
DOCA in fowl and mouse
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
DOCA in rabbit
Yamagata et al C5967/55 (RES)
DOCA Ø in rat
Dewitt et al B96691/54
(mast cells)
DOCA (locally)+Diseases (various)
in man
Benjamin and Cornbleet C4815/54
(spreading)
DCG in fowl and mouse
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
Desoxocortisone in fowl
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
Desoxocortisone in man
Martin et al C5617/55
(leucocyte metabolism)
Desoxocortisone in mouse
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
Ovarian extract in rabbit
Yamagata et al C5967/55 (RES)
Folliculoids
Iversen C823/54 (discussion)
Ozeki C3329/53
(opsonic index of *leucocytes*
in vivo)
Folliculoids in fowl and mouse
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
Folliculoids luteoids in rabbit
Yamagata et al C5967/55 (RES)
Luteoids+ABA (antihistamine) in rat
Cazzola C132/53 (eosinophils
in skin uterus)
Relaxin
Iversen C823/54 (discussion)
Testoids
Iversen C823/54 (discussion)
Testoids in rabbit
Yamagata et al C5967/55 (RES)
Pregnenolone in fowl and *mouse*
Gillette and Buchsbaum C5979/55
(fibroblasts in vitro)
Thyroidectomy ↓+Sodium potassium
polyphosphate (radioactive)
in dog
Frimmer C1827/53
(RES clearance)
Thyroxin in rabbit
Yamagata et al C5967/55 (RES)
Thyroxin Ø in rat
Dewitt et al B96691/54
(mast cells)
Thyroxin+Age (embryonic) in fowl
Fell C4238/55 (various in vitro)
Thyroxin ↑+Sodium potassium
polyphosphate (radioactive)
in dog
Frimmer C1827/53
(RES clearance)
Pancreas extract (padutin) insulin
in rabbit
Yamagata et al C5967/55 (RES)
Insulin glucagon+Age (embryonic)↳
in fowl
Fell C4238/55
(various tissues in vitro)
Age ↑ in rat
Boas and Foley B98139/54
(hexosamine in connective
tissues)
Aging
Banfield C824/54 (review)

Connective Tissue ←
Stressors (Systemic)

Diseases (various)
Keech C6796/55
(skin collagen electron microscopic)
Diseases (various) in man
Asboe-Hansen C833/54
Trauma
Mahaux B97085/54
(spreading–review)
Trauma Ø in rat
Boas and Foley B98139/54
(hexosamine in connective
tissues)
Trauma+Dye in man
Tyler et al B99414/54
(dye retention)
Cold (discussion)
Mahaux B97085/54 (spreading)
Ionizing rays ↑ in rat
Upton and Gude C3289/54
(spreading)
Atmospheric high pressure in guinea pig
Frada and Romano B96028/53
(spreading)
Serum (horse) in rabbit
Vikhert B96397/53 (histiocytes)
ABA ↑ in rat
Cazzola C132/53
(eosinophils in skin uterus)
Amniotic fluid ↑ in rat
Jasmin et al B98673/54
(anaphylactoid reaction)

Antibiotic (penicillin) ↑ in man
Oldano and Brustio B99816/53
(phagocytosis)
Ascorbic acid in rabbit
Yamagata et al C5967/55 (RES)
Azulene ↓+Egg white in rat
Gaspar Nemeth and Issekutz
B98015/53 (anaphylactoid
reaction)
Benzoylcarbinol derivatives in rat
Cresseri and Meli C523/53
(spreading)
Chymotrypsin ↓+Dextran in rat
Cohen et al C4552/55
(anaphylactoid reaction)
Cpd 48/80 Ø in rat
Devitt et al B96691/54
(mast cells)
Cpd 48/80 ↓+Egg white in rat
Feldberg B96826/53
(anaphylactoid reaction)
Dextran+Phenergan ↓ in rat
Halpern C5664/54
(anaphylactoid edema)
Dextran+Trypsin in rat
Beiler et al C6294/55
(anaphylactoid reaction)
Dextran+Trypsin ↓ in rat
Cohen et al C4552/55
(anaphylactoid reaction)
Egg albumin+Amino acid deficiency
Csalay et al C4908/54
(anaphylactoid reaction)
Egg albumin+Phenylbutazone in rat
Hillebrecht B99128/54
(anaphylactoid reaction)
Egg albumin+Salicylate ↓ in rat
van Cauwenberge et al B98320/53
(anaphylactoid reaction)
Egg albumin+Trypsin in rat
Beiler et al C6294/55
(anaphylactoid reaction)
Histamine ↑ in rat
Cazzola C132/53
(eosinophils in skin uterus)
Histamine (inhaled) in rat
Gross B99811/53
(anaphylactoid reaction)
Liquorice in rabbit
Itô et al C3305/54 (spreading)
Methyldiphenylcarbometoxyketopropane
diol in rat
Cresseri and Meli C523/53
(spreading)
Pyrogen in man
Bergmann et al C6217/54
(phagocytosis of blood in vitro)
Tumor exudate (i v) in rat
Jasmin and Richer C4274/55
(anaphylactoid reaction)

Fasting Ø in rat
Boas and Foley B98193/54
(hexosamine in connective
tissues)
Starvation ↓ in man
Laveratos et al C1089/54
(RES function)
Malnutrition in man
Balch and Spencer B98720/54
(phagocytosis)
Ascorbic acid deficiency in guinea pig
Persson B96546/53
(ground substance)
Stressors in mouse
Asadi et al. C2623/54 (histology)
Stress
Dunn C2868/54
(reticular—review)

Inflammation and Wound Healing

(For anaphylactoid inflammation see preceding chapters)
In this section the bracketed remarks characterize the local situation in the inflammatory focus thus giving details on the target under study (e g phagocytosis NaCl) the locally applied irritant (e g croton oil trauma) and the site of application If several local irritants are applied simultaneously or one after the other in the same animal they are connected by plus signs (e g croton oil+dye) If various irritants have been locally applied in different experiments the names of the irritants are separated by commas (e g croton oil dye)

Generalities
Adamkiewicz et al C1121/54
(NaCl exchange potassium exchange in granuloma pouch after
croton oil)
Adams Ray B96420/52
(after cold—discussion)
Albaum and Milch B97925/54
(ATP in muscle after cold, heat
trauma to muscle in rabbit)
Albert Weil B97909/54
(tuberculous abscess after heparin
in man)
Albert Weil and Murat B97103/54
(tuberculous abscess after heparin
in man)
Atkinson et al. C1113/54
(after cortisol i c in man)
Baggi B96695/52
(*viscosity of exudate after croton* oil
olive oil+hyaluronidase i p
in guinea pig)
Baggi and Favilli C4100/54
(viscosity hexosamine in
exudate after croton oil i p
intrapleurally in guinea pig and
rabbit)

Baker C73/54 (after cortisone DOCA folliculoids testoids cholesterol into orbital connective tissue of rat)
Baron C4346/55 (wound healing after dressing in guinea pig)
Barone and Briganti C3779/54 (adhesions after trauma+ fibrinolytic enzymes i p)
Benjamin and Cornbleet C4814/53 (wound healing of skin after cold heat in man)
Berg B96562/54 (after spermatozoa)
Boas and Foley B98139/54 (hexosamine water in connective tissues after various stressors)
Bohrod C3404/55 (histology of allergic and related lesions)
Bory B97705/53 (anthrax furuncle ← cold)
Busse Grawitz B99334/54 (after killed staphylococci i p in rabbit)
Carbonera and Pirani C5298/55 (after albumin γ globulin mucoprotein intradermally in guinea pig and rabbit, Arthus phenomenon after albumin globulin mucoprotein in rabbit)
Caselli and Caputo B99100/53 (protein, polysaccharides in Rivalta positive exudates)
Chirico and Viola C2536/54 (after vegetal coal in mouse)
Devenyi and Holczinger C5662/54 (wound healing–histology)
Dexter et al B97115/54 (exudate after ATP i p in rat)
Dougherty and Schneebeli C5934/55 (after cortisone+ DOCA+gelatin s c in mouse structure and anti inflammatory activity of corticoids in mouse inflammation after cortisol radioactive s c to mouse)
Felder B99147/53 (protein in pleural exudate in man)
Goldman C62 8/55 (histology after cortisol 9 fluorocortisol i c in man)
Busse Grawitz B98081/54 (formation of leucocytes after radium to skin in rabbit)
Heard B964_4/53 (after blood cl t int pleural sac in rat)
Heite C5689/55 (wound healing after ionizing rays+ointments to ear of rabbit)
Hogues B96685/53 (vessel contraction after section of vessel in rabbit–review)
Humphrey and Jaques C4898/54 (histamine in leucocytes of peritoneal exudates in ferret guinea pig rabbit and rat)
Koch and Uebel B98667/54 (spreading of infection after *Streptococcus*+echinacein s c in guinea pig)
Koontz and Curtis B99550/54 (fibrous tissue after tantalum gauze in man)
Lecomte C1973/54 (after veratrin i c +local anesthetic antihistamine)
de Luca B96361/52 (tributyrinolytic lipase in exudates)
Menkin C4595/55 (tumorigenesis after trauma to ear of rabbit)
Moran and Sherman C19/54 (after intramural injection into stomach of ground peas meat barium sulphate kaolin chlortetracycline gastric juice in rabbit)
Parma and de Vincenzo C10/54 (after air subcutaneously in rabbit)
Partington B97409/52 (vessel dilatation after ultraviolet rays to skin)
Partington B97409/52 (red reaction and triple response after histamine histamine liberators intradermally in rabbit)
Pecchiai C9/54 (after foam rubber i p in rat)
Peirce and Polley C532/54 (necrosis after adrenaline derivatives)
Perrault and Shear C4405/53 (local Shwartzman phenomenon after tumor extract)
Potts B96387/53 (after kaolin subcutaneously in man)
Prodi and Miceli C5681/55 (spreading of India ink diphtheria toxin after ionizing rays to skin of rabbit)
Rindani C4275/55 (histology phagocytes in granuloma pouch after croton oil kaolin turpentine +dye in rat)
Rindani C4579/54 (granuloma pouch after antihistamine+croton oil in rat)
Romani B96694/53 (after oxyketopregnenolone retroperitoneally in guinea pig)
Romani C4607/54 (histology PAS positive cells after turpentine s c)
Schilling et al C6_84/55 (NaCl potassium calcium phosphorus protein fractions in wound fluid in guinea pig)

Smith et al C2168/51 (after glass dust in guinea pig hamster and mouse)
Spiers C3414/55 (monocytes eosinophils mast cells neutrophils in peritoneal fluid after histamine i p in mouse)
Spiers and Wenck C4134/55 (eosinophils after asbestos talc glass fibers silica paper fibers cotton i p in mouse
Tronnier B99129/54 (after placenta extract + ultraviolet light to skin)
Ungar and Damgaard C1023/51 (protein after heat to skin in vitro)
Vaillancourt B96841/54 (after nicotinic acid ester to skin of man)
Valeton and Doepfner C5901/54 (Shwartzman phenomenon in guinea pig)
Wiedling C1068/48 (after adrenaline + anesthetic vasopressin + copper adrenaline + copper nickel zinc vasopressin + adrenaline s c in rabbit)
Wilde C4/54 (after wood and wood extract subcutaneously in guinea pig and rabbit)
Yamane B97672/53 (permeability of lymph nodes after turpentine in dog)
Yasuhira et al B97661/52 (pH in exudate)
Zachariae and Moltke B99590/54 (fibroblasts mast cells after cortisol cortisone in rabbit)
Zini B98802/53 (spreading after glucuronic acid + hyaluronidase in guinea pig and rabbit)

Inflammation and Wound Healing ← Stimuli

Denervation
Kesztyus et al B99784/51 (Arthus phenomenon Shwartzman phenomenon)
Denervation ↓ in man
Lecomte C1973/54 (after veratrin i c)
Denervation Ø in rat
Saunders and Sissons B98112/5ɔ (wound healing of muscle)
Sympathectomy Ø in dog
Kay et al B99165/53 (frostbite after cold)
Hormones (discussion)
Zachariae C835/54 (wound healing)
Hypophysectomy ↓ in newt
Schotte and Lindberg B99673/54 (regeneration)

Hypophysectomy in rat
Adamkiewicz et al C1121/54 (pH iron Cl in exudate of granuloma pouch after croton oil)
Hypophysectomy Ø in rat
Desaulles C3831/54 (granuloma weight/body weight after cotton pellets subcutaneously)
Stebbins and Stoerk B98242/55 (granuloma weight after cotton pellets subcutaneously)
Hypophysectomy ↓ in rat
Adamkiewicz et al C1121/54 (exudate granuloma weight of granuloma pouch after croton oil)
Dontenwill B99918/53 (after heat to skin)
Hypophysectomy ↑ in rat
Adamkiewicz et al C1121/54 (carbohydrates fat nitrogen Na potassium in exudate of granuloma pouch after croton oil)
Hypophysectomy + STH + Tuberculosis in rat
Lemonde C310/54 (tuberculin reactions)
Hypophysectomy + Adrenal transplant of frog ↑ in newt
Schotte and Lindberg B99673/54 (regeneration)
Hypophysectomy + Thiourea thyroxin ↑ in rat
Desaulles C3831/54 (after cotton pellet s c)
Hypophysectomy + Dye in rat
Dontenwill B99918/53 (capillary permeability after heat to skin)
ACTH
Dougherty C3408/55 (inflammation including allergic type review)
Kallos C4123/55 (allergic inflammation review)
Mazzei and de Benedetti C6078/54 (local Shwartzman phenomenon)
Raffel C3405/55 (hypersensitivity reactions discussion)
ACTH in guinea pig
Seebohm et al B98499/54 (dinitrochlorobenzene)
ACTH in man
Gross et al C3095/54 (eosinophils in pleural exudate)
ACTH ↓ in man
Mahaux B97086/54 (spreading after hemoglobin i c + hyaluronidase)
ACTH (systemically and locally) ↓ in man
Scalabrino B99447/54 (exudate of pleuritis)
ACTH in mouse
Toosy C4226/55 (wound healing of ulcer after ionizing rays)

ACTH Ø in rabbit
Ierasalo et al B99456/53
(wound healing)
ACTH ↓ in rabbit
Crabbé B99485/54 (exudate after irritant to pleura)
Crabbe B99486/54 (phagocytosis after bacteria i p)
Hugues et al C1985/54
(Arthus phenomenon)
Ito et al. C3305/54
(wound healing)
ACTH (systemically locally) in rabbit
Narpozzi C6756/55 (capillary permeability after exudate intradermally)
ACTH ↓ in rat
Pollay et al B96591/54
(trichinosis of muscle)
ACTH (locally) Ø in rat
Stebbins and Stoerk B98242/ND
(granuloma weight after cotton pellets subcutaneously)
ACTH Ø in salamander
Bragdon and Dent C429/54 (limb regeneration after amputation)
ACTH+STH in rat
Selye C2007/55 (granuloma pouch after croton oil)
ACTH+Cortisone in rabbit
Narpozzi C6756/55 (capillary permeability after exudate intradermally)
ACTH+DOCA in rat
Selye C2007/55 (granuloma pouch after croton oil)
ACTH+Testoids MAD methyltestosterone in rat
Selye C2007/55 (granuloma pouch after croton oil)
ACTH+Bacterial toxin (intradermal)
Verge and Paraf B95396/54
(production of Shwartzman phenomenon)
ACTH Ø+Tuberculosis in pig
Luke B98309/53
(tuberculin reaction)
ACTH+Heat+Humidity in rat
Clay and Nelson B99483/54
(spreading after hyaluronidase)
ACTH Ø+Dye in rat
Van Cauwenberge et al C1978/54
(capillary permeability after chloroform to skin)
STH
Iversen C823/54 (discussion)
Selye B98553/55 (review)
STH in mouse
Chirico and Viola C3832/54
(after charcoal)
STH Ø in rat
Stebbins and Stoerk B98242/55
(granuloma weight after cotton pellets subcutaneously)
STH ↑ in rat
Lichtwitz et al C3855/53
(after staphylococci s c)
STH (locally) ↑ in rat
Stebbins and Stoerk B98242/55
(granuloma weight after cotton pellets subcutaneously)
STH Ø+Adrenalectomy+Cortisol in rat
Selye B100000/54
(granuloma pouch after croton oil)
STH+Adrenalectomy+Cortisol+DOCA ↑
Selye and Bois C1718/55
(granuloma pouch after croton oil)
STH+Adrenalectomy+Cortisol+DOCA +Ovariectomy in rat
Bois and Selye C4580/55
(granuloma pouch after croton oil)
STH+Adrenalectomy+Cortisol+DOCA+ Ovariectomy in rat
Bois and Selye C4580/55
(granuloma pouch after croton oil)
STH+Adrenalectomy+DOCA in rat
Selye B100000/54
(granuloma pouch after croton oil)
STH+Adrenalectomy+DOCA+ Ovariectomy in rat
Bois and Selye C4580/55
(granuloma pouch after croton oil)
Selye and Bois C1718/55
(granuloma pouch after croton oil)
STH+Adrenalectomy+Aldosterone ↑+ Ovariectomy in rat
Selye and Bois C1718/55
(granuloma pouch after croton oil)
STH+Adrenalectomy+NaCl in rat
Bois and Selye C4580/55
(granuloma pouch after croton oil)
Selye B100000/54
(granuloma pouch after croton oil)
STH (locally) ↑ +Cortisone in rat
Stebbins and Stoerk B98242/55
(granuloma weight after cotton pellets subcutaneously)
STH+Tuberculosis in rat
Lemonde C310/54
(tuberculin reaction)
CTH+Sex in mouse
Toosy C4226/55 (wound healing of ulcer after ionizing rays)
TTH
Iversen C823/54
(discussion)
TTH ↓ in guinea pig
Moltke C4559/55 (tensile strength in wound healing)
TTH ↑ in rabbit
Asboe Hansen C1756/54
(spreading after hyaluronidase)

TTH Ø+Thyroidectomy in guinea pig
Moltke C1059/53 (tensile strength in wound healing)
Adrenalectomy in hamster
Shulman et al. B99509/54 (wound healing after burns to cheek pouch)
Adrenalectomy in mouse
Dougherty and Schneebeli C5934/55 (histology after cortisone+histamine pyrogen s c histology after cpd A cpd B cortisone cortisol desoxocortisone allopregnanediol DOCA allopregnanetriol dione 19 nor 17α cortisol 11 dihydro-allo cortisone+gelatin s c)
Speirs C3414/55 (total cells eosinophils in peritoneal fluid after saline mineral oil egg albumin pollen extract ascaris extract pyromen asbestos fibers heparin bovine albumin horse serum i p)
Adrenalectomy Ø in rat
Stebbins and Stoerk B98242/ND (granuloma weight after cotton pellets subcutaneously)
Adrenalectomy ↑ in rat
Desaulles C3831/54 (after cotton pellets s c)
Adrenalectomy+ACE (systemically locally)+Cortisone+Heat+Humidity in rat
Clay and Nelson B99483/54 (spreading after hyaluronidase)
Adrenalectomy+ACE+Salicylate ↓ in rat
van Cauwenberge et al. C1978/54 (capillary permeability after chloroform to skin)
Adrenalectomy+Cortisone in mouse
Dougherty and Schneebeli C5934/55 (histology after pyrogen s c)
Adrenalectomy+Cortisone ↓ in rat
Kief et al C5644/53 (wound healing)
Singer and Borman C5214/55 (after cotton pellets s c)
Adrenalectomy+Cortisone+DOCA in rabbit
Crabbe C4347/54 (phagocytosis by macrophages after irritant intrapleurally)
Adrenalectomy+Cortisone (free alcohol locally)+DOCA+NaCl in rat
Desaulles et al C6266/55 (after cotton pellets s c)
Adrenalectomy+Cortisone+Heat+Humidity in rat
Clay and Nelson B99483/54 (spreading after hyaluronidase)
Adrenalectomy+Cortisone+Serologic reactions in mouse
Dougherty and Schneebeli C5934/55 (histology after antigen s c)
Adrenalectomy+Cortisol ↓ in rat
Singer and Borman C5214/55 (after cotton pellets s c)
Adrenalectomy+Cortisol+DOCA+Ovariectomy+Folliculoids in rat
Selye et al C5677/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+DOCA+Folliculoids+Sex in rat
Selye C839/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+DOCA+MAD in rat
Selye C2007/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol (free alcohol locally)+DOCA+NaCl in rat
Desaulles et al C6266/55 (after cotton pellets s c)
Adrenalectomy+Cortisol+DOCA+Diet in rat
Ventura C5857/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+Aldosterone ↑ in rat
Anonymous C3867/55 (granuloma pouch after croton oil discussion)
Selye B98265/55 C1451/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+Ovariectomy+Folliculoids ↓ in rat
Selye C1824/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+Ovariectomy+Luteoids in rat
Selye C839/55 (granuloma pouch after croton oil)
Selye et al C5677/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+Folliculoids in rat
Selye et al C5677/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+MAD in rat
Selye C2007/55 (granuloma pouch after croton oil)
Adrenalectomy+Cortisol+NaCl in rat
Selye C2008/55 (granuloma pouch after croton oil)
Adrenalectomy+9α chlorocortisol ↓ in rat
Singer and Borman C5214/55 (after cotton pellets s c)
Adrenalectomy+9 fluorocortisol ↓ in rat
Singer and Borman C5214/55 (after cotton pellets s c)
Adrenalectomy+DOCA ↑ in rat
Kief et al C5644/53 (wound healing)
Adrenalectomy+DOCA Ø in rat
Singer and Borman C5214/55 (after cotton pellets s c)
Adrenalectomy+DOCA+Aldosterone (locally systemically)+NaCl in rat

Desaulles et al. C6266/55
(after cotton pellets s c)
Adrenalectomy + DOCA + Cpd B (locally) + NaCl in rat
Desaulles et al C6266/55
(after cotton pellets s c)
Adrenalectomy + DOCA + Ovariectomy + Folliculoids in rat
Selye C839/55 C1824/55
(granuloma pouch after croton oil)
Selye et al C5677/55
(granuloma pouch after croton oil)
Adrenalectomy + DOCA + Folliculoids in rat
Selye et al C5677/55
(granuloma pouch after croton oil)
Adrenalectomy + DOCA (locally systemically) + NaCl in rat
Desaulles et al C6266/55
(after cotton pellets s c)
Adrenalectomy + DOCA + Diet in rat
Ventura C5857/55
(granuloma pouch after croton oil)
Adrenalectomy + Ovariectomy + Folliculoids + Luteoids in rat
Selye et al C5677/55
(granuloma pouch after croton oil)
Adrenalectomy + Ovariectomy + Luteoids in rat
Selye et al C5677/55
(granuloma pouch after croton oil)
Adrenalectomy + Luteoids Ø in rat
Singer and Borman C5214/55
(after cotton pellets s c)
Adrenalectomy + Thiourea in rat
Desaulles C3831/54
(after cotton pellets s c)
Adrenalectomy + Thyroxin ↑ in rat
Desaulles C3831/54
(after cotton pellets s c)
Adrenalectomy Ø + Heat + Humidity in rat
Clay and Nelson C461/54
(spreading after hyaluronidase)
Adrenaline in man
Benjamin and Cornbleet C4814/53
(wound healing of skin)
Adrenaline in mouse
Toosy C4226/55 (wound healing of ulcer after ionizing rays)
Adrenaline derivatives ↑ in rabbit
Hugues B96635/53 (vessel contraction after trauma to mesentery ear)
ACE Ø + Tuberculosis in pig
Luke B98309/53
(tuberculin reaction)
ACE (locally) ↓ + Tuberculosis in pig
Luke B98309/53
(tuberculin reaction)
ACE Ø + Dye in rat
van Cauwenberge et al C1978/54
(capillary permeability after chloroform to skin)

Corticoids
Baker and Abrams C3427/55
(review)
Dougherty C5408/55
(inflammation including allergic type)
Iversen C8_3/54 (review)
Kallos C4123/55 (allergic inflammation review)
A Cs
Romani C3911/54
Cortisone
Baggi and Favilli C2404/54
(cells in exudate hyaluronic acid in exudate)
Dougherty C1367/54 (discussion)
Howes C8_5/54
(wound healing—discussion)
Lattes et al C676/54
(wound healing of infected wound)
Raffel C3405/55 (hypersensitivity reactions—discussion)
Romani C3911/54
Cortisone (locally)
Zacco C3923/54 (in joints)
Cortisone in amphibia
Manner C675/54 (regeneration of limb) C6472/55 (regeneration)
Cortisone in guinea pig
Baggi C2727/54 (hyaluronic acid in exudate after croton oil intraperitoneally)
Baggi and Favilli C4100/54
(exudate viscosity leucocytes macrophages after croton oil i p)
Houghton et al C298/54 (ulcer formation after ionizing rays to skin)
Lichtwitz et al C3853/53
(tuberculin reaction)
Seebohm et al B98499/54
(dinitrochlorobenzene)
Summa and Volpicelli B98469/53
(histology of skin after hyaluronidase)
Williams C347/54 (wound healing after trauma to stomach)
Cortisone (locally) in guinea pig
Koch and Uebel B98667/54
(histology PAS positive material argyrophil fibers mucopolysaccharides fibroblasts after *Streptococcus* s c)
Cortisone (locally) ↑ in guinea pig
Koch and Uebel B98667/54
(spreading of infection after *Streptococcus* s c)
Cortisone ↓ in hamster
Shulman et al B99569/54
(wound healing after burns to cheek pouch)
Cortisone (locally) Ø in man
Gross et al C3095/54
(eosinophils in pleural exudate)

Cortisone ↑ in man
Walker C1475/55 (wound healing after crush injury of hand)
Cortisone ↓ in mouse
Schober B99074/52 (after carcinogen to skin)
Cortisone in rabbit
Baggi and Favilli C4100/54 (exudate viscosity after croton oil intrapleurally)
Cavallero C829/54 (after myxoma virus)
Crabbé C4347/54 C4350/54 (phagocytosis by macrophages after irritant intrapleurally) C6461/55 (phagocytosis macrophages in pleural exudate)
Turner and Hollander B99549/54 (syphilis)
Williams C347/54 (wound healing after trauma to stomach)
Cortisone ↓ in rabbit
Crabbé B99485/54 (exudate after irritant to pleura) B99487/54 (phagocytosis after bacteria i p)
Howes C625/54 (wound healing)
Hugues et al C1985/54 (Arthus phenomenon)
Infranzi and Mazzeo B96125/53 (pleural adhesions after talcum iodine to pleura)
Perasalo et al B99846/53 (wound healing)
Quattrocchi and Rao C464/54 (Shwartzman phenomenon)
Quattrocchi and Russo C6207/54 (Arthus phenomenon)
Schmid Bircher B99368/54 (wound healing)
Cortisone (locally) Ø in rabbit
Zachariae and Moltke B99590/54 (wound healing)
Cortisone in rat
Williams C347/54 (wound healing *after trauma to stomach)*
Cortisone ↓ in rat
Baker C73/54 (after cholesterol into orbital connective tissue)
Cresseri and Meli C523/53 (*after agar s c*)
Kief et al C5644/53 (wound healing)
Kleinfeld and Habif C1161/54 (in granuloma pouch after croton oil)
Lichtwitz et al C3853/53 (after staphylococci s c)
Montgomery and Green B98150/54 (wound healing)
Schayer C5212/55 (edema after compound 48/80)
Cortisone (locally) ↓ in rat
Stebbins and Stoerk B98242/ND (granuloma weight after cotton pellets subcutaneously)
Cortisone Ø in salamander
Bragdon and Dent C429/54 (limb regeneration after amputation)
Cortisone+DOCA in rabbit
Perasalo et al B99846/53 (wound healing)
Cortisone ↓+Age (embryonic) in fowl
Kilbourne C6080/55 (after virus)
Cortisone+Heat+Humidity in rat
Clay and Nelson B99483/54 (spreading after hyaluronidase)
Cortisone+Azoyperite in rabbit
Narpozzi C6756/55 (capillary permeability after exudate intradermally)
Cortisone+BCG+Cysteinamine+Ascorbic acid deficiency in guinea pig
Long C2732/54 (*tuberculin reaction*)
Cortisone+Cartilage extract ↑
Martin et al C1383/54 (after gauze)
Cortisone+Choline in mouse
Heller C5194/55 (after antibiotic i p)
Cortisone Ø+*Croton* oil (intravenously) in guinea pig and rabbit
Baggi C2727/54 (hyaluronic acid in pleural exudate)
Cortisone ↓+Dye in rabbit
Hayashi et al C6097/55 (*capillary permeability after* leucotaxine histamine acetylcholine intradermally)
Cortisone Ø+Dye in rat
van Cauwenberge et al C1978/54 (*capillary permeability* after chloroform to skin)
Cortisone+Tissue extract (defatted embryo extract beef amniotic fluid) ↑ in rat
Montgomery and Green B98150/54 (wound healing)
Cortisone (locally)+Tissue extracts (*various*) ↑ in rat
Stebbins and Stoerk B98242/55 (granuloma weight after cotton pellets subcutaneously)
Cortisone+Ascorbic acid deficiency in guinea pig
Persson B96546/53 (ground substance)
Cortisone withdrawal ↑ *in rat*
Desaulles and Meier B98549/54 (granuloma weight after cotton)
Cortisol
Romani C3911/54
Cortisol (locally)
Zacco C3923/54 (in joints)

Cortisol ↓ in dog
Menkin C447/54 (leukotaxin in exudate after turpentine intrapleurally leucocytosis promoting factor)
Cortisol ↓ in man
Mahaux B97086/54 (spreading after hemoglobin + hyaluronidase i c)
Cortisol (locally) in man
Bonomo et al. B98623/54 (cells lymphocytes protein fractions polysaccharides viscosity in pleural exudate)
Haxthausen C6260/55 (electrophoretic patch test)
Cortisol (locally) Ø in man
Ballabio and Sala B98828/54 (NaCl potassium in pleural exudate)
Cortisol (locally) ↓ in man
Ballabio and Sala B98828/54 (exudate in rheumatic pleuritis and pericarditis)
Ballabio et al B98622/54 (pleural exudate)
Bergmann B97105/54 (Arthus phenomenon)
Bonomo et al. B98623/54 (2-globulin mucoprotein in pleural exudate)
Castellana and Rizzi C566/54 (pleural exudate)
Kawamura and Tatai C2171/54 (tuberculin reaction)
Scalabrino B99447/54 (exudate of pleuritis)
Cortisol (locally) Ø in rabbit
Zachariae and Moltke B99590/54 (wound healing)
Cortisol (locally) ↓ in rabbit
Zachariae B96682/54 C6459/55 (adhesions after talc i p)
Cortisol ↓ in rat
Bois and Selye C4580/55 (granuloma pouch after croton oil)
Cortisol (locally) in rat
Romani C5679/55 (after turpentine)
Cortisol (locally) ↓ in rat
Rindani C4183/54 (in granuloma pouch after croton oil)
Cortisol + DOCA in rat
Bois and Selye C4580/55 (granuloma pouch after croton oil)
Cortisol (locally) ↓ + Desoxocortisone (locally) in rat
Rindani C440/54 (in granuloma pouch after croton oil)
DOC in guinea pig
Lichtwitz et al. C5853/53 (tuberculin reaction)
DOC in rat
Lichtwitz et al C5853/53 (after staphylococci s c)
DOC (locally) ↑ in rat
Rindani C4183/54 (in granuloma pouch after croton oil)
DOCA ↑ in rabbit
Quattrocchi and Rao C464/54 (Shwartzman phenomenon)
Quattrocchi and Russo C6207/54 (Arthus phenomenon)
DOCA in rat
Baker C73/54 (after cholesterol into orbital connective tissue)
Bois and Selye C4580/55 (granuloma pouch after croton oil)
Cresseri and Meli C523/53 (after agar s c)
Kief et al C5644/53 (wound healing)
DOC diethylacetate (locally) in rat
Rindani C4183/54 (granuloma pouch after croton oil)
DOC trimethylacetate ↑ in rat
Romani C4609/54 (histology PAS positive cells in granuloma after turpentine)
Desoxocortisone (locally) ↑ in rat
Rindani C4183/54 (in granuloma pouch after croton oil)
9α fluorocorticosterone ↓ in rat
Singer and Borman C5214/55 (after cotton pellets s c)
Ovariectomy + Folliculoids ↑ testoids Ø in rat
Sjovall C814/54 (wound healing of vagina)
Folliculoids in guinea pig
Lichtwitz et al C5853/53 (tuberculin reaction)
Folliculoids in mouse
Toosy C4226/55 (wound healing of ulcer after ionizing rays)
Folliculoids in rat
Baker C73/54 (after cholesterol into orbital connective tissue)
Lichtwitz et al C 853/53 (after staphylococci s c)
Folliculoids (locally) ↓ in rat
Rindani C4183/54 (granuloma pouch after croton oil)
Folliculoids (locally) + Age + Serologic reactions in man
Schwartz C4027/54 (after antigen to skin)
Folliculoids + Season in frog
Bethmann B98384/53 B98490/53 (after irritant to mesenterium)
Luteoids (locally) in rat
Rindani C4183/54 (granuloma pouch after croton oil)

9α fluorohydroxyprogesterone
9α fluorohydroxyprogesterone
in rat
Singer and Borman C5211/55
(after cotton pellets s c)
Pregnancy ↑ in man
Borrone C3147/54
(after GTH s c)
Menstruation in man
Fukumoto B97628/52
(tuberculin reaction)
Solari et al C5991/55 (after vegetal oil folliculoids testoids luteoids + vegetal oil intradermally)
Testis extirpation ↑ in rat
Desaulles C3831/54
(after cotton pellets s c)
Testis extirpation + Thiourea
thyroxin ↑ in rat
Desaulles C3831/54
(after cotton pellets s c)
Testoids in guinea pig
Lichtwitz et al C3853/53
(tuberculin reaction)
Testoids in mouse
Toosy C1226/55 (wound healing of ulcer after ionizing rays)
Testoids in rat
Baker C73/54 (after cholesterol into orbital connective tissue)
Lichtwitz et al C3853/53
(after staphylococci s c)
Marsili and Comuzzi B96423/53
(wound healing—skin)
Testoids (locally) in rat
Rindani C4183/54
(granuloma pouch after croton oil)
Acetoxypregnenolone (locally) ↑ in rat
Rindani C4183/54 (in granuloma pouch after croton oil)
Testoids (locally) + Age + Serologic reactions in man
Schwartz C4027/54
(after antigen to skin)
MAD Ø in rat
Marsili and Comuzzi B96423/53
(wound healing—skin)
Dehydroisoandrosterone Ø in rat
Marsili and Comuzzi B96423/53
(wound healing—skin)
Pregnenolone ↓ in rabbit
Quattrocchi and Russo C464/54
(Shwartzman phenomenon)
Quattrocchi and Russo C6207/54
(Arthus phenomenon)
Thyroidectomy Ø in guinea pig
Moltke C4559/55 (tensile strength in wound healing)
Thyroidectomy (radioiodine) ↓
in guinea pig
Nilzen C1867/55
(Arthus phenomenon)
Thyroidectomy + Thyroxin ↓ in guinea pig
Moltke C4559/55 (tensile strength in wound healing)
Thiourea in guinea pig
Krug B99640/54
(allergic in skin)
Thiourea ↑ in man
Tyszka B99818/53 (after histamine s c tuberculin reaction)
Thiourea in mouse
Toosy C1226/55 (wound healing of ulcer after ionizing rays)
Thiourea in rabbit
Krug B99640/54
(allergic in skin)
Thiourea in rat
Desaulles C3831/54
(after cotton pellets s c)
Thiourea ↓ in rat
Khomullo B96647/53
(wound healing—skin)
Thyroxin ↓ in guinea pig
Moltke C4559/55 (tensile strength in wound healing)
Nilzen and Hussey B98907/54
(after croton oil to skin)
Thyroxin Ø in mouse
Chirico and Viola C5039/54
(after charcoal s c)
Thyroxin ↑ in rat
Desaulles C3831/54
(after cotton pellets s c)
Khomullo B96647/53
(wound healing—skin)
Thyroxin + Tuberculosis in rat
Lemonde C310/54
(tuberculin reaction)
Thyroxin ↓ + Serologic reactions
in guinea pig
Nilzen and Hussey B98907/54
(after dinitrochlorobenzene to skin)
Pancreatectomy (partial) ↓
Lledo B98304/53 (spreading after hyaluronidase + ink)
Alloxan ↓
Lledo B98304/53 (spreading after hyaluronidase + ink)
Alloxan ↓ in rabbit
Cruickshank B99061/54
(after staphylococci intradermally)
Pineal extract (locally) ↓ in man
Bergmann B97105/54
(Arthus phenomenon)
Inflammation (healing of another wound) ↑
in rabbit
Engley et al C1893/55
(wound healing)
Heredity + Tumor (various—transplants)
in mouse
Tarfentjev C4404/55 (spreading)

Inflammation and Wound Healing ← Stressors

Microbes, in hamster
Frenkel C5_03/55 (microbes after cortisone, cortisol, DOCA, s.c.)
Trauma ↓ in man
Mahaux B9706/54 (spreading after hyaluronidase i.c.)
Depilation
Sandblom and Muren C5564/54 (wound healing)
Vessel constriction, in man
Benjamin and Cornbleet C4514/53 (wound healing of skin)
Vessel ligature in mouse
Youngner and Algire B9S021/49 (hemorrhage in granulation tissue)
Burns in rat
Levenson et al. C5565/54 (wound healing)
Heat+Humidity in rat
Clay and Nelson C461/54 (spreading after hyaluronidase)
Cold, in hamster
Smith C1050/54 (frostbite)
Cold, in man
Kuhl et al. C5506 55 (spreading after hyaluronidase)
Ionizing rays ↓ in mouse
Ravenos B99667/54 (wound healing)
Ionizing rays Ø in rat
Ungar and Damgaard C1019/54 (after histamine i.c.)
Ionizing rays in rat
Ungar and Damgaard C1019/54 (after heat to skin histamine liberator i.c.)
Atmospheric high pressure ↑ in guinea pig
Frada and Romano B960_8/55 (wound healing)
Serum (of wounded rabbit) ↑ in rabbit
Engley et al. C1893/55 (wound healing)
Vaccine (tuberculin)—*Nitrogen mustard* ↓ in rabbit
Cohen and Mohychic B97694 54 (size and intensity of tuberculin skin reaction)
Vaccine (tuberculin)—Thorotrast ↑ in rabbit
Cohen and Mohychic B97694/54 (intensity of tuberculin skin reaction)
ABA (SY _8) in rabbit
Rall et al. C5283/55 (local Shwartzman reaction)
ABA (antihistamine) Ø in rat
Dontenwill B9918/53 (after heat to skin)
Anesthetic ↓ in mouse
Chutna C752/54 (wound healing)
Anesthetic ↓ in rabbit
Valbert C4312/54 (Shwartzman phenomenon, Arthus reaction)
Anesthetic (procaine) ↓ in rabbit
Hirsch et al. C3055/54 (local Shwartzman phenomenon)
Antibiotic Ø in guinea pig
Hausberger and Ramsay C4451/55 (infection after cortisol s.c.)
Azovperte (systemically locally) in rabbit
Narpozzi C6756 55 (capillary permeability after exudate intradermally)
Benzoylcarbinol derivatives in rat
Cresseri and Meli C523/55 (after agar s.c.)
Calcium gluconate in rabbit
Hugues et al. C1985/54 (Arthus phenomenon)
Chymotrypsin Ø in rat
Kleinfeld and Habif C1161/54 (granuloma pouch after croton oil)
Dicoumarol Ø in rabbit
Rothfeld et al. B9672 54 (local Shwartzman phenomenon)
Drugs (anticoagulant antiphlogistic uricosuric—discussion)
Sougin Mibashan and Horwitz C6_54/55
Dye in mouse
Kato and Gozsy C5905/55 (phagocytic activity of endothelial cells of skin capillaries after histamine coal tar chrysarobin, resorcin, ichthyol, camphor menthol, thymol, pyrogallic acid, salicylate benzoic acid, boric acid, tannic acid, bismuth salts zinc oxide titanium salts to skin)
Dye in rabbit
Menkin C5_5/55 (leucocytes capillary permeability after leukotaxin)
Dye+Phenergan ↓ *in rat*
van Cauwenberge et al. C1978/54 (capillary permeability after chloroform to skin)
Flavonoids, in rat
Fuhrman C5961/55 (frostbite)
Heparin in guinea pig
Isidor C1184/54 (wound healing)
Heparin in rabbit
Cluff and Berthrong B967_6/53 (local Shwartzman phenomenon)
Lecomte and Hugues C19_0/54 (Arthus phenomenon)
Rall et al. C77_7/55 (local Shwartzman phenomenon)
Hyaluronic acid
Pinkus and Perry C1/53 (wound healing)

9α fluorohydroxyprogesterone
    9α fluorodihydroxyprogesterone
    in rat
    Singer and Borman C5214/55
    (after cotton pellets s c)
Pregnancy ↑ *in man*
    Borrone C3147/54
    (after CTH s c)
Menstruation in man
    Fukumoto B97628/52
    (tuberculin reaction)
    Solari et al C5091/55 (after
    vegetal oil folliculoids testoids
    luteoids + vegetal oil intradermally)
Testis extirpation ↑ in rat
    Desaulles C3831/54
    (after cotton pellets s c)
Testis extirpation + Thiourea
    thyroxin ↑ in rat
    Desaulles C3831/54
    (after cotton pellets s c)
Testoids in guinea pig
    Lichtwitz et al C3853/53
    (tuberculin reaction)
Testoids in mouse
    Toosy C4226/55 (wound healing
    of ulcer after ionizing rays)
Testoids in rat
    Baker C73/54 (after cholesterol
    into orbital connective tissue)
    Lichtwitz et al C3853/53
    (after staphylococci s c)
    Marsilii and Comuzzi B96423/53
    (wound healing–skin)
Testoids (locally) in rat
    Rindani C4183/54
    (granuloma pouch after croton oil)
Acetoxypregnenolone (locally) ↑ in rat
    Rindani C4183/54 (in granuloma
    pouch after croton oil)
Testoids (locally) + Age + Serologic
    reactions in man
    Schwartz C4027/54
    (after antigen to skin)
MAD Ø in rat
    Marsilii and Comuzzi B96423/53
    (wound healing– skin)
Dehydroisoandrosterone Ø in rat
    Marsilii and Comuzzi B96423/53
    (wound healing–skin)
Pregnenolone ↓ in rabbit
    Quattrocchi and Russo C464 54
    (Shwartzman phenomenon)
    Quattrocchi and Russo C6.07 54
    (Arthus phenomenon)
Thyroidectomy Ø in guinea pig
    Moltke C4559/55 (tensile strength
    in wound healing)
Thyroidectomy (radioiodine) ↓
    in guinea pig
    Nilzen C1867/55
    (Arthus phenomenon)
Thyroidectomy + Thyroxin ↓ in guinea pig
    Moltke C4559/55 (tensile strength
    in wound healing)
Thiourea in guinea pig
    Krug B99640/54
    (allergic in skin)
Thiourea ↑ in man
    Tyszka B99816/53 (after histamine
    s c tuberculin reaction)
Thiourea in mouse
    Toosy C4226/55 (wound healing
    of ulcer after ionizing rays)
Thiourea in rabbit
    Krug B99640/54
    (allergic in skin)
Thiourea in rat
    Desaulles C3831/54
    (after cotton pellets s c)
Thiourea ↓ in rat
    Khomullo B96647/53
    (wound healing–skin)
Thyroxin ↓ in guinea pig
    Moltke C4559/55 (tensile strength
    in wound healing)
    Nilzen and Hussey B98907/54
    (after croton oil to skin)
Thyroxin Ø in mouse
    Chirico and Viola C5039/54
    (after charcoal s c)
Thyroxin ↑ in rat
    Desaulles C3831/54
    (after cotton pellets s c)
    Khomullo B96647/53
    (wound healing–skin)
Thyroxin + Tuberculosis in rat
    Lemonde C310/54
    (tuberculin reaction)
Thyroxin ↓ + Serologic reactions
    in guinea pig
    Nilzen and Hussey B98907/54
    (after dinitrochlorobenzene to skin)
Pancreatectomy (partial) ↓
    Lledo B98504/53 (spreading
    after hyaluronidase + ink)
Alloxan ↓
    Lledó B98504/53 (spreading
    after hyaluronidase + ink)
Alloxan ↓ in rabbit
    Cruickshank B99061/54
    (after staphylococci intradermally)
Pineal extract (locally) ↓ in man
    Bergmann B97105/54
    (Arthus phenomenon)
Inflammation (healing of another wound) ↑
    in rabbit
    Engley et al C1893/55
    (wound healing)
Heredity + Tumor (various–transplants)
    in mouse
    Harfenties C4404/55 (spreading)

Irgapyrin ↓ in man
Seidel and Knobloch B99231/54
(after ultraviolet rays to skin)

Liquonce ↓ in rabbit
Ito et al C3305/54
(wound healing)

Methionine ↑ in guinea pig
Isidor C1181/54 (wound healing)

Methyldiphenylcarbometoxyketopropane diol in rat
Cresseri and Meli C523/53
(after agar s c)

NaCl ↑ in man
Yoshimura et al B97621/52
(vessel reactivity after cold)

Nitrogen mustard Ø in rabbit
Pepys B98903/54
(tuberculin reaction)

Phenylbutazone
Wilhelmi and Pulver C4787/55
(phenylbutazone in various exudates)

Phenylbutazone in guinea pig
Wilhelmi and Pulver C4787/55
(phenylbutazone in skin with ultra violet light erythema)

Protein ↑ in man
Yoshimura et al B97621/52
(vessel reactivity after cold)

Protein Ø in rat
Calloway et al. B99085/54
(after burn trauma)

Rutin Ø in rabbit
Lewis and Moen B97997/53
(necrosis after cold to skin and muscle)

Salicylate ↓ in rabbit
Hugues et al C1985/54
(Arthus phenomenon)

Tromexan ↓ in rabbit
Ball et al C2777/55
(local Shwartzman phenomenon)

Trypsin in man
Golden C5648/54 (various)
Innerfield C5650/54 (diabetic cellulitis leg *ulcer*)

Trypsin Ø in rat
Kleinfeld and Habif C1161/54
(granuloma pouch after croton oil)

Vitamin A ↑ in man
Lorenzoni and Bellettini B98070/53
(skin *reaction* to tuberculin)

Vitamin D Ø in man
Lorenzoni and Bellettini B98070/53
(skin reaction to tuberculin)

Gravity in guinea pig
Baron C4346/55 (wound healing)

CONNECTIVE TISSUE DISEASES

(For earlier pertinent data cf also AROS 1952 pp 293 295 AROS 1953 pp 366-368 AROS 1954 pp 515 517)

Rheumatic Fever

Pathogenesis
Bohrod C3404/55 (G-A S)
Hochrein and Schleicher C981/52 (G-A S)
Kelley C6211/55 (adrenals)
Kelley et al C655/54 C2160/55 (adrenals)
Long C1365/54 (pancreas)
Peterman C1554/54 (enzymes)
Souhé et al. B96554/54 (trauma)

Rheumatic Fever ← Stimuli

ACTH and/or cortisone
Adams B99945/54
Anonymous C2128/55 C4942/55 C6401/55 (discussion)
Asiel C1461/55 (discussion)
Bernard and Roussier B99310/54
Bunim B97170/54 (review)
van Cauwenberge C2618/54
Debré et al. C651/54
Done et al. C6597/55
Fischel and Frank C653/54
Hirsch C654/54
Houli C4433/55 (discussion)
Kelley C6221/55
Kinsell C1364/54
Kroop B99898/54
Long C1365/54
Lovgren B96759/54
Massell B99539/54 B99540/54 B99541/54 (review)
Massell and MacDonald C656/54 (subcutaneous nodules)
McEwen C2000/54 C3196/55 (discussion)
Monnet C2179/55
Nava C3303/54 (discussion)
Rammelkamp and Stolzer C695/54
Raynaud et al C6175/54
Schoen C5984/55 (discussion)
Stražer et al C3952/54
Taran B97282/54 (discussion)

ACTH + Infection + Antibiotic
Pfeiffer and Schoffling C4808/55

ACTH + Salicylate
Gelli and Menichini B99543/53

Adrenaline (intravenously)
Arsov B97902/54

Corticoids
Bauer B99311/54 (discussion)
Boland C3198/55 (discussion)

Cortisone + Age
Holt C1028/54

Folliculoids
Asheshov et al C3596/55 (microphage virus system in vitro)
Hemmerly and Demerec C3599/55 (mutagenicity in *Escherichia*)
Hitchings and Elion C3598/55 (*Lactobacillus casei* screening test in vitro)
Reilly C3597/55 (various bacteria in vitro)

Luteoids
Colomer C3948/55 (discussion)
Kilbourne C4062/55 (influenza virus in chick embryos)

11 hydroxyprogesterone
Kilbourne C4062/55 (influenza virus in chick embryos)

SEROLOGIC REACTIONS

(For earlier pertinent data cf also *Stress* pp 752 765 AROS 1951 pp 458 463 AROS 1952 pp 296 298 AROS 1953 pp 370 371 AROS 1954 pp 518 520)

Generalities
de Lavergne C1329/53 (antibodies—review)
Ungar B98069/53 (allergic reactions—biochemical mechanism)
Various authors C3403/55 (review)

Serologic Reactions ← Various

(For additional data cf also "Resistance")

Nerves (ANS)
Enenkel C6198/54 (discussion)

Hypophysectomy+Ionizing rays+Spleen shielding ↑+Antigen in rat
Nagareda B99538/54 (antibodies in blood)

Hypophysectomy Ø+Antigen in rat
Nagareda B99538/54 (antibodies in blood)

ACTH
Dougherty C3408/55 (antibodies anaphylaxis—review)
Freund C2399/53 (anamnestic response—discussion)
de Lavergne C1329/53 (antibodies in blood—review)
Schafer C4789/55 (allergy—discussion)

ACTH in guinea pig
Seebohm et al B98499/54 (passively transferred hypersensitivity reaction to dinitrochlorobenzene)

ACTH (extract from urine) ↓ in guinea pig
de Barbieri and Zamboni C2206/54 (antibodies in blood)

ACTH ↓ in mouse
Newsom and Darrach C4943/55 (antibodies in blood)

ACTH in rabbit
Gordon and Benditt C6296/55 (complement in blood)

ACTH+Hemolytic diseases (autoimmune) in dog
Miller et al C4076/55 (panagglutinin in blood)

ACTH ++Tetanus toxoid, in rabbit
Beurey et al C186/53 (tetanus antitoxin in blood)

ACTH+Vaccine in rabbit
Inzerillo and Chiti B99744/53 (agglutinins in blood)

STH
Schafer C4855/55 (discussion)

STH in man
Shorr et al C4258/55 (STH precipitins in blood)

STH in rabbit
Gordon and Benditt C6296/55 (complement in blood)

GTH LTH
Schafer C4855/55 (discussion)

GTH (anti GTH production) in rat
Baju z C6759/55 (allergy)

TTH (discussion)
Schafer C4789/55 (allergy)

TTH in rabbit
Gordon and Benditt C6296/55 (complement in blood)

Hypophyseal posterior lobe extract
Schafer C4855/55 (discussion)

Adrenalectomy+Serological reactions in mouse
McMaster et al C3983/54 (anaphylactic reaction)

Adrenalectomy+Vaccine in rat
Chiti and Inzerillo B99729/52 (agglutinins in blood)

Corticoids
Dougherty C3408/55 (antibodies anaphylaxis—review)
Freund C2399/53 (anamnestic response—discussion)
de Lavergne C1329/53 (antibodies in blood—review)
Schafer C4789/55 (allergy—discussion)

Cortisone in guinea pig
Seebohm et al B98499/54 (passively transferred hypersensitivity reaction to dinitrochlorobenzene)

Cortisone Ø in man
Friedman B96827/53 (antibodies in blood)

Collagen diseases
Klemperer C831/54 (review)
Collagen diseases—Pathogenesis
Bohrod C3401/55 (G A S)
Schroeder B98809/54 (apresoline)
Collagen diseases → Eye ← ACTH and/or cortisone
Godtfredsen C834/54
Collagen diseases → Joints
Sperling B97683/54 (review)
Panchondritis ← ACTH and/or cortisone
Harders C3023/54
Sarcoidosis—Pathogenesis (hypopituitarism)
Skssor et al C851/54
Sarcoidosis ← ACTH
Alimurung and Grajo C1203/53
Sarcoidosis ← Cortisone
Bogart et al B98517/54
Citron B99548/54
Israel et al B98231/54
Kay and Royster C657/54
Sarcoidosis (neurohypophyseal complications) ← ACTH and/or cortisone
Albeaux Fernet et al C1937/54
Sarcoidosis ← ACTH and/or cortisone + Antibiotic
Heilmeyer C72 54
Sarcoidosis (hypercalcaemic) → Calcium in feces ← Cortisone ↑
Anderson et al B96839/54
Sarcoidosis → Calcium in blood urine ← Cortisone ↓
Citron B99548/54
Sarcoidosis (hypercalcaemic) → Calcium in blood ← Cortisone ↓ + Vitamin D
Anderson et al B98839/54
Sarcoidosis → Spleen (weight) ← Cortisone ↓
Kay and Royster C657/54
Scars (hypertrophic) ← Cortisol (locally)
Griswold B97878/54
Weber Christian disease ← ACTH and/or cortisone
Beaudry B97888 54
Weber Christian disease (nodosities) ← *Cortisol + Arthritis*
Yaffee C6652/55

MICROBES

(For earlier pertinent data cf also AROS 1952 p 295 AROS 1953 p 369 AROS 1954 p 517)

Microbes ← Various

Hypophyseal posterior lobe hormones Ø
Hirsch C2721/54
(*Myco tuberculosis* in vitro)

ACTH
Freerksen C1124/43
(tubercle bacilli in vitro)
Hill and Rheins C432/54
(*fowlpox virus in embryonated eggs*)
Hirsch C2721/54
(*Myco tuberculosis* in vitro)

ACTH + Sulfate
Hirsch C2721/54
(*Myco tuberculosis* in vitro)

STH
Lemonde C310/54
(tubercle bacilli in vitro)

STH + Cortisone
Scherr et al. C658/54
(vaccinia virus in embryonated eggs)

Cortisone
Baum et al B99546/54
(*Histoplasma capsulatum* in vitro)
Freerksen C1124/54
(tubercle bacilli in vitro)
Hill and Rheins C432/54 (fowlpox virus in embryonated eggs)
Kilbourne C4062/55 (influenza virus in chick embryos) C5332/55 (reactivation of noninfective virus)
Sigel and Beasley C1907/55 (virus)

Cortisone (locally) in hamster
Frenkel C5303/55 (microbes after i c injection)

Cortisone ↑ + Poliomyelitis virus in hamster
Shwartzman B98275/54
(polio virus in hibernating gland)

Cortisone ↑ + Streptococci in rabbit
Denny and Thomas C2770/55
(streptococci in blood)

Cortisol
Asheshov et al C3596 55
(*microphage virus systems in vitro*)
Hemmerly and Demerec C3599/55
(mutagenicity in *Escherichia*)
Hitchings and Elion C3598/55
(*Lactobacillus casei* screening test in vitro)
Kilbourne C4062/55
(influenza virus in chick embryos)
Reilly C3597/55
(various bacteria in vitro)

Cortisol (locally) in hamster
Frenkel C5303/55
(*microbes after i c injection*)

DOC cpd A cpd B 11a hydroxy cortisone desoxocortisone
Kilbourne C4062/55
(influenza virus in chick embryos)

DOCA (locally) in hamster
Frenkel C5303/55
(*microbes after i c injection*)

Allergy ← Adrenaline
Winton and Nora C6072/55
(penicillin)
Allergy ← Cortisol
Burrage and Irwin B99512/54
(review)
Shulman C6_26/55
Allergy (acute attack) → Histamine
(free) in urine ← Cortisone ↑
Mitchell et al C4026/54
Allergy ← Capillary permeability ←
Cortisone DOCA
Farreroas Co B98350/53
B99322/54
Rh incompatibility ← Cortisone
Anonymous C4703/54
Rh incompatibility (of mother) →
Resistance (of newborn) ←
Cortisone+Pregnancy
Hunter et al B99565/54
Rh incompatibility (of mother) →
17 KS pregnanediol in urine ←
Cortisone+Pregnancy
Hunter et al B99565/54
Serum sickness—Pathogenesis (G A S)
Bohrod C3404/55
Serum sickness ← ACTH and/or
cortisone (discussion)
Williams C6428/55
Vaccinia (generalized) → Adrenals
(histology)
Hill et al C37/53

NEOPLASIA

(For earlier pertinent data cf also *Stress* pp 768 770 AROS 1951 pp 471 473 AROS 1952 pp _98 500 AROS 1953 pp 372 376 AROS 1954 pp 521 529)

Generalities
Anonymous C6487/55
(*hormones and tumors*)
Berenblum B98825/54 (tumor pathogenesis review influence of inflammation various hormones discussion)
Bory B97705/53 (immunization against cancer by local cold treatment)
Everse C3_04/ND
(adrenals and cancer)
Fischer C754/54
(*bodily defense reactions*)
d Gaetani C4793/ND (review on connective tissue and neuroendocrine relationships in man)
Hadfield B98754/54 (mammary carcinoma and folliculoid production of adrenal)
Hara B9769/52 (leucocytosis promoting and leucopenic factors in cancer)
Hoepke B97078/53 (role of RES basophils plasma cells and lymphocytes)
Hohlweg B97488/53 (sex hormones and tumor in man)
Josserand B97460/54 (antineoplastic function of certain adrenal hormones)
Judmaier B98391/53 (diagnosis cutaneous test with sex hormones in man)
Levi Montalcini and Hamburger B97255/53 (a diffusible agent of mouse sarcoma producing hyperplasia of sympathetic ganglia and hyper neurotization of viscera in the chick embryo)
Richer C5853/55—Various *transplantable neoplasms of the rat* have been successfully transplanted from granuloma pouch to granuloma pouch by merely transferring the exudate which apparently always contains variable cells This technique is time saving and much more convenient than conventional transplantation procedures
Rosch B97135/54
(malignancy and collagen disorders)
Rosenkranz B97351/53 (diabetes mellitus and carcinoma—review)
Schober B96406/5_
(*tumor and nervous system*)
Truscott B98782/54 (steroid vitamin A carcinogen interrelations)
Wauer B98728/53 (hypertension and arteriosclerosis seldom in carcinoma)
Pathogenesis (endocrines G A S)
Berenblum B98825/54
(hormones—discussion)
Bittner C942/54 (adrenals)
Blumberg et al B98790/54 (G-A S)
Carboncini and Pisi C1445/ND
(adrenals hypophysis)
Ellerker C4106/55 (thyroid)
von Euler B98586/54 (G A S)
Lipschutz C2225/54 (hypophysis)
McManus and Sommers B98179/53
(hormones)
Samuels B99072/54 B99073/53
C581/54 (hypophysis)
Spencer C4107/55 (thyroid)
Tromp C2590/ND (stress)
C4805/55 (psychic stress)
Way B99473/54 (hypophysis)
Pathogenesis (various)
Ayre B98618/54 B98_35/54
(L A S)
Berenblum B98825/54
(review inflammation—discussion)
Dietrich B98171/54 (review carcinoma after local trauma)

Cortisone in rabbit
Crabbe C4348/54 C4349/54
C6161/55 (antibodies in blood)
Gordon and Benditt C6296/55
(complement in blood)
Wood et al C3468/54
(fever accelerating serum factor)
Cortisone ↓+Tetanus toxoid in rabbit
Beurey et al C186/53
(tetanus antitoxin in blood)
Cortisone+*Serologic reactions (Arthus* phenomenon) in rabbit
Quattrocchi and Russo C6207/54
(precipitins in blood)
Cortisol Ø in man
Friedman B96527/53
(antibodies in blood)
Cortisol ↑ in man
Sidi and Bourgeois Gavardin B97841/54 (desensitization to different antigens)
DOCA+Serologic reactions (Arthus phenomenon) in rabbit
Quattrocchi and Russo C6207/54
(precipitins in blood)
Cpd B ↓ in mouse
Newsom and Darrach C4943/55
(antibodies in blood)
Folliculoids
Schafer C4855/55 (discussion)
Luteoids
Colomer C3948/54 (discussion)
Placenta extracts ↓ in rabbit
Tadžer et al C2457/54
(typhoid antibodies in blood)
Testoids
Schafer C4855/55 (discussion)
Pregnenolone+Serologic reactions (Arthus phenomenon) in rabbit
Quattrocchi and Russo C6207/54
(precipitins in blood)
Prostate hormone
Schafer C4789/55
(allergy discussion)
Thyroidectomy (radioiodine) in guinea pig
Nilzen C1867/55
(Schultz Dale reaction)
Thyroxin (discussion)
Schafer C4789/55 (allergy)
Thyroxin+Vaccine in rabbit
Chiti and Inzerillo B99731/53
Insulin
Schafer C4789/55
(allergy discussion)
Thymus extract+Vaccine in rabbit
Inzerillo and Chiti B99743/53
(agglutinins in blood)
Inflammation (wound healing) in rabbit
Engley et al C1893/55 (antibodies and other indicators in blood)
Heredity+Tumor (various–transplants) in mouse
Parfentjev C4401/55
(hypersensitivity)

Hypothermia in dog
Rabboni and Giglio C1686/53
(complement activity opsonic index bactericidal activity in blood)
Hibernation (artificial)
Jentzer C5784/53 (discussion)
Electroshock ↓ in man
Kurosaka B97838/52
(precipitin reaction with anti *fibrinogen serum)*
Hypoxia ↓ in man
Kurosaka B97838/52 (precipitin reaction with antifibrinogen serum)
ABA (various) in dog
Rabboni and Giglio C1686/53
(complement activity opsonic index bactericidal activity in blood)
Anesthetic (ether) ↓ *in guinea pig*
Zanussi and Mazzei C3028/53
(anaphylaxis)
Dextran in man
Moeller C4001/55
Protein (foreign) in rabbit
Mellors et al C5918/55 (antibodies in heart kidney vessels)

Serologic Diseases

Allergic subsepsis (Wissler Fanconi s syndrome) ← ACTH
Musso B99320/53
Allergy
Halpin B98046/54 (review)
Allergy–Pathogenesis
Bloom and Wolff C301/54
(ACTH and/or cortisone)
Brodwall C91/54 (ACTH and/or cortisone)
Forgacs et al *C4015/54*
(ACTH and/or cortisone)
Lohmeyer C738/54
(ACTH and/or cortisone)
McDowall B96532/53 (adrenals)
Perkoff et al C2485/55
(ACTH and/or cortisone)
Solem and Romcke B98026/54
(ACTH and/or cortisone)
Allergy ← ACTH and/or cortisone
Burrage and Irwin B99512/54
(review)
Harvey B97173/54
(drugs–discussion)
Melli and Zanussi C6073/54
(review)
Shulman C6226/55
Velez C5792/54 (discussion)
Winton and Nora *C6072/55*
(penicillin)
Allergy ← ACTH and/or cortisone+ Blood transfusion
Maurer C6495/55

Hypophysis irradiation (ionizing rays) Ø
  in mouse
  Lorenz C4285/54 (ascites tumor)
Hypophysis irradiation (short waves)+
  Hormones (various)
  Samuels B99072/53 B99073/53
  (carcinoma)
Hypophyseal transplant in man
  Wanke C3730/54 (mammary
  carcinoma—discussion)
  Wolfers C2514/54
  (various—discussion)
Hypophyseal tumor (ACTH secreting)
  in mouse
  Handler C4580/55
  (human tumor—transplanted)
ACTH and/or cortisone in man
  Bethell B97179/54
  (various—discussion)
  Ciulla C666/54 (uterine fibroids)
  Everse C254/54
  (carcinoma—discussion)
  Fahey et al B99914/54
  (Wegener s granulomatosis)
  Morin et al C6716/54
  (prostate carcinoma)
  Pearson et al C6224/55
  (mammary carcinoma lymphosar
  coma prostate carcinoma—
  discussion)
  Phillips B97271/53
  (neuroblastoma– discussion)
  Seror C4353/54
  (carcinoma—discussion)
  Terracol and Camps C3704/54
  (malignant granuloma)
ACTH in mouse
  Audier B96667/53
  (mammary carcinoma)
ACTH Ø in rat
  Willig C972/54
  (sarcoma—transplanted)
ACTH ↓+STH in mouse
  Mirand and Hoffman C4 96/55
  (carcinoma—tran planted)
ACTH ↓+Folliculoids in rabbit
  Brocq and Stora C5946/55
  (uterus fibroma)
ACTH ↑+Age (immature) in mouse
  Silberberg and Silberberg C4412/55
  C6010/55 (lymphoma—
  spontaneous)
ACTH+Ionizing rays in rat
  Szegvari et al C5473/54
  (rabbit carcinoma tran planted into
  testis)
STH (discussion)
  Pearson C6404/55
  (mammary carcinoma)
STH ↑ in mouse
  Mirand and Hoffman C4596/55
  (carcinoma—transplanted)
STH+Adrenalectomy+DOC+
  Gonadectomy+Ionizing rays
  in mouse
  Nagareda and Kaplan C4401/55
  (lymphoma—induced)
STH+Cortisone ↓ in mouse
  Mirand and Hoffman C4396/55
  (carcinoma—transplanted)
TTH+Adrenalectomy+DOC+
  Gonadectomy+Ionizing rays
  in mouse
  Nagareda and Kaplan C4401/55
  (lymphoma—induced)
Vasopressin, in mouse
  Goldie et al C4374/55
  (sarcoma—transplanted i p)
  Pradhan et al C5282/55
  (sarcoma—transplanted)
Adrenalectomy
  Cade C6702/54 (mammary
  carcinoma prostate carcinoma)
  Cautray C3713/54
  (mammary carcinoma)
  Leberman et al B98553/54
  (prostate carcinoma)
  Pearson C6404/55
  (mammary carcinoma—discussion)
Adrenalectomy in man
  Anonymous C6563/55
  (mammary carcinoma—discussion)
  Bateman and Winship C4559/55
  (mammary carcinoma)
  Cuningham C216/54 (mammary
  carcinoma with metastases)
  Everse C254/54 (prostate
  carcinoma mammary carcinoma—
  review)
  Goldstein and Weinberg C5003/54
  (prostate carcinoma—discussion)
  Horning and Cade C6700/54
  (mammary carcinoma)
  Huggins and Dao C6725/54
  (mammary carcinoma)
  Lawrence and Irwing C2894/54
  (mammary carcinoma)
  Loeser C4105/55
  (carcinoma—discussion)
  Manera et al C2893/53
  (mammary carcinoma)
  Randall B96556/54 (prostate
  carcinoma—spontaneous various
  tumors—spontaneous)
  Saegesser B97373/53
  (mammary carcinoma)
  Sanders C2895/54
  (mammary carcinoma)
  Seror C44/54 (mammary carcinoma
  —discussion) C4354/54 (carcinoma,
  sarcoma—discussion)
  Seror et al C45/54
  (mammary carcinoma)
  de Seze et al B98750/53
  (mammary carcinoma—metastases)

Cortisone ↑ in mouse
Baserga and Shubik C1171/55
(metastases of carcinoma transplant after removal of primary growth)
Christen et al. B99125/54
(mammary carcinoma transplant—metastases)
Tallman and Gasió B99126/54
(mammary carcinoma transplant—metastases)
Cortisone in rat
Bollag and Meyer C572/54
(sarcoma—transplanted)
Szegvari et al. C5473/54
(rabbit carcinoma transplanted into testis)
Cortisone (systemically locally) in rat
Koch and Uebel C6693/54
(carcinoma—transplanted)
Cortisone ↑ in rat
Toolan B99032/54 (growth of human tumor—transplanted)
Cortisone + Folliculoids + Testis extirpation, in man
Miller and Hinman C5009/53
(prostate carcinoma)
Valk and Owens C5006/54
(prostate carcinoma)
Cortisone + Luteoids + Testoids in man
Selbger C237/54 (carcinoma)
Cortisone + Thyroid extract in man
Lemon C4590/55 (various)
Cortisone + Tumor (human sarcoma transplanted before) in hamster
Toolan C1894/55
(human sarcoma transplant)
Cortisone + Virus
Moore C4597/55
(human tumor—transplanted)
Cortisone + Serologic reactions (previous sarcoma-transplant) + Carcinogen in mouse
Bussolati C2619/54
(sarcoma induced)
Cortisone ↑ + Drugs (tumor inhibiting polycyclic hydrocarbons)
Green C548/54 (various)
Cortisone (locally) ↓ + Carcinogen (to skin) in mouse
Ghadially and Green C2405/54
(papilloma—induced)
Cortisone + Carcinogen
Schober B9729/53
(various—induced)
Cortisone + Carcinogen in mouse
Bussolati C2619/54
(sarcoma—induced)
Schober B99074/52
(skin tumor—induced)

Cortisone + Carcinogen in rat
Leathem C4569/55
(liver tumor—induced)
Vangelista C5-85/53
(tumor—induced)
Cortisone + Vitamin A, in mouse
Delann C2413/54 C5475/54
(adenocarcinoma—transplanted)
Cortisol in guinea pig
Mardones et al. C5984/52
(fibroma—induced)
Cortisol Ø in man
Scholler et al. C4410/55
(mammary carcinoma—spontaneous)
Cortisol in mouse
Clarke C5568/55
(sarcoma 180—transplanted)
Creech et al. C5594/55
(ascites tumor—transplanted)
Gellhorn et al. C3592/55
(mammary carcinoma glioma—transplanted)
Goldie et al. C4375/55
(sarcoma—transplanted metastatic spread)
Scholler et al. C3591/55
(mammary carcinoma—transplanted)
Skipper and Thomson C5593/55
(leukemia—transplanted)
Sugiura C3589/55
(carcinoma sarcoma—transplanted)
Tarnowski C3590/55 (mammary carcinoma—transplanted)
Cortisol in rat
Sugiura C3589/55 (carcinoma sarcoma—transplanted)
Cortisol in rabbit
Gellhorn et al. C3592/55
(carcinoma—transplanted)
Cortisol + Folliculoids (chlorotrianisene) in man
Carroll and Brennan C1769/55
(prostate carcinoma)
Cortisol (locally) ↓ + Sex + Carcinogen in mouse
Zachariae and Asboe-Hansen
(growth of skin tumor—induced)
DOC + Ovariectomy in guinea pig
Mardones et al. C5984/52
(fibroma—induced)
DOCA + Ionizing rays in man
Nicolov C590/54
(uterus carcinoma)
DOCA + Ascorbic acid in man
Criscenti B98706/53
(fibroma of rhinopharynx)
Desoxycortisone in guinea pig
Mardones et al. C3984/52
(fibroma—induced)

Folliculoids (locally) Ø+Croton oil (locally) in mouse
Graffi and Gummel B96403/52 (skin tumor—induced)
Luteoids (discussion)
Colomer C3948/54 (various)
Luteoids Ø in rat
Bly et al C5297/55 (Walker tumor—transplanted)
Luteoids (locally) Ø+Croton oil (locally) in mouse
Graffi and Gummel B96403/52 (skin tumor—induced)
Pregnancy in man
Byrd and McGanity B99366/54 (melanoma—discussion)
Pregnancy in mouse
Homburger and Tregier B96966/54 (growth of sarcoma 180 transplant)
van Swyndregt and Demol C3390/54 (mammary carcinoma—transplanted)
Pregnancy in rat
Bly et al. C5297/55 (Walker tumor—transplanted)
Testis extirpation Ø+Carcinogen in mouse
Váczy et al C5870/54 (tumor—induced)
Testoids Ø in man
Astorri C2863/53 (carcinoma—transplanted)
Testoids (locally) in man
Sullivan and Allen C4417/55 (mammary carcinoma)
Testoids in rabbit
Jaki et al C2867/54 (tumor)
Testoids+Thyroxin in man
Loeser C4105/55 (carcinoma—discussion)
Testoids Ø+Carcinogen in mouse
Váczy et al C5870/54 (tumor—induced)
Testoids (locally) Ø+Croton oil (locally) in mouse
Graffi and Gummel B96403/52 (skin tumor—induced)
Dehydroisoandrosterone acetate ↑ in fish
Quemer and Wrba B96699/53 (tissue proliferation)
Etiocholane 3α 11β diol 17 one in man
Plantin and Birke C5684/55 (carcinoma)
Thyroidectomy Ø in mouse
Lorenz C4285/54 (ascites tumor)
Thyroidectomy ↓ in rat
Schober B96406/52 (growth of Walker tumor—transplant)
Thyroidectomy ↓+Carcinogen in rat
Bielschowsky and Hall C194/53 (liver tumor—induced)

Thiourea in mouse
Grad et al C4377/55 (leukemia spontaneous incidence)
Thiourea ↑ in rat
Rosin and Rachmilewitz B96967/54 (growth of face tumor—induced)
Taddei C3286/53 (survival of carcinoma—transplanted)
Thiourea ↓+Age (immature) in rat
Schober B96406/52 (growth of Walker tumor—transplant)
Thyroxin
Anonymous C6018/55 (cancer—discussion)
Thyroxin in man
Anonymous C6018/55 (cancer—discussion)
Handler and Wyatt C6388/55 (carcinoma—discussion)
Loeser B96957/54 (growth of mammary and genital carcinoma—spontaneous) C549/54 (carcinoma)
Rochat and Schafter C2408/54 (carcinoma)
Thyroxin in mouse
Grad et al C4377/55 (leukemia spontaneous incidence)
Alloxan in rat
Goranson et al B99658/54 (hepatoma—transplanted)
C4576/55 (hepatoma—transplanted Walker tumor—transplanted)
Pineal extract ↓ in mouse
Engel and Fischl C1144/54 (carcinoma—spontaneous)
Pineal extract ↓+Carcinogen in mouse and rat
Engel and Fischl C1144/54 (tumor—induced)
Thymus irradiation (ionizing rays) Ø in mouse
Lorenz C4285/54 (ascites tumor)
Thymus extract in rat
Szegvari et al C5473/54 (rabbit carcinoma—transplanted)
Spleen liver extract (from carcinogen treated calves) in man
de Gaetani B97742/53 (various)
Age (mature)+Iodine ↑ in rat
Schober B96406/52 (growth of Walker tumor—transplant)
Heredity+Nerves in mouse
Raushenbakh et al B97214/52 (incidence of leucosis—spontaneous)

Neoplasia ← Stressors

Inflammation (allergic at transplantation site) Ø in mouse
Molomut et al C3276/55 (sarcoma—transplanted)

Adrenaline noradrenaline in adrenals
von Euler et al C_075/54
(carcinoma)
Cortisol cpd B in adrenal venous blood ←
ACTH
Hudson and Lombardo C2480/55
(mammary carcinoma)
Corticoids in urine ← ACTH
Provezza C6723/54
(uterine myoma)
F Cs in urine ← Androstanedione ↑
Segaloff et al C4411/55
(mammary carcinoma)
Corticoids in urine ← *Pineal extract*
Lenti et al B98731/54
(carcinoma)
17 KS in urine
Hargreaves and da Costa
B97468/53 (uterus carcinoma)
Rochat and Schafter C2408/54
(carcinoma)
17 KS in urine (fractions)
Perrini and Zacco C5633/55
(carcinoma)
17 KS in urine ← Hypophyseal
irradiation (ionizing rays)+
Testis extirpation
Gibba C5010/54
(prostate carcinoma)
17 KS in urine ← ACTH+Adrenalectomy
(partial)+Adrenal venous blood
shunting through liver+Splenec
tomy
Forsham C5421/55
(mammary carcinoma)
17 KS in urine ← Adrenalectomy+
Cortisone+Testis extirpation
Leberman et al B98533/54
(*prostate carcinoma*)
17 KS in urine ← Cortisone
Bonner and Homburger C4365/55
(various)
17 KS in urine ← Pineal extract
Lenti et al B98731/54
(carcinoma)
17 KS in urine ← Ionizing rays (radium)
Grattarola C3145/55
(uterus carcinoma)
17 KS in urine ← Ionizing rays
Maurer B96753/54
(various tumors–spontaneous)
Folliculoids in urine ← ACTH+
Adrenalectomy (partial)+
Adrenal venous blood shunting
through liver+Splenectomy
Forsham C5421/55
(mammary carcinoma)
Pregnanediol in urine ← Adrenalectomy+
Luteoids
Sommerville C4104/55 (carcinoma)
↑ Histamine in urine
Pernow and Waldenstrom B99699/54
(carcinoma)
↑ Serotonin in blood urine
Pernow and Waldenstrom B99699/54
(carcinoma)
Serotonin in blood (discussion)
Anonymous B99700/54
(argentaffinoma)
Serotonin metabolites in urine ←
Serotonin
Page et al. C1473/55 (carcinoma)
Phosphatase (alkaline) ← Hypophysectomy
+STH+Adrenalectomy+Cortisone
+Ovariectomy
Pearson C4986/55
(mammary carcinoma)
Phosphatase (acid) in blood ← Cold+ABA
(chlorpromazine)
London et al. B99687/54
(prostate carcinoma)
ATP in blood ← Ionizing rays ↓
Maurer B96753/54
(various tumors–spontaneous)
Hypophysis (histology)
Langeron et al C5655/55
(brain tumor)
Adrenals (weight)
Bergenstal et al C3657/55
(carcinoma)
Adrenals (histology)
Hudson and Lombardo C2480/55
(mammary carcinoma)
Langeron et al C5655/55
(brain tumor)
Stoner et al B96395/53
(*various sarcomas*)
Adrenals (histology) ← Folliculoids
(chlorotrianisene)
Carroll and Brennan C1789/55
(prostate carcinoma)
Uterus (secretory phase) ← Ovariectomy
Grunberger B97499/54
(uterus cancer)
Testis (histology) ← Adrenalectomy
Hotchkiss B98548/53
(prostate carcinoma)
↑ Eosinophils in blood
Siliquini and Durando C25_8/54
(uterus carcinoma)
Lymph nodes ← Ionizing rays
de Palo and Papadia C5018/54
(carcinoma)
Spleen ← ACTH cortisone
Reinhard and Loeb C6431/55
(lymphoma)

MALFORMATIONS

(For earlier pertinent data cf also *Stress* pp 770-771 AROS 1951 p 474 AROS-1952 p 300 AROS 1953 p 376 AROS 1954 p 530)

Malformations ← Various

ACTH+Pregnancy+Age in mouse
Fraser et al. C244/54 (cleft palate)

Wound healing (locally) + *Carcinogen* in rabbit
Breedis C4360/55
(tumor induced regression)
Vessel ligature in mouse
Youngner and Algire B98021/49
(hemorrhage in carcinoma sarcoma–transplant)
Vessel ligature ↑ + Carcinogen in rabbit
Ritchie B97183/52 (growth of skin tumor–induced)
Heat (locally) Ø in rat
Hoffmann B96702/54 (growth of Jensen sarcoma transplant)
Heat (locally) ↓ in rat
Hoffmann B96702/54 (growth of Walker tumor transplant)
Cold Ø in mouse
Lorenz C4285/54 (ascites tumor)
Ionizing rays (thermal neutron) in mouse
Upton et al B99035/54
(various tumors–induced)
Ionizing rays in rat
Szegvári et al C5473/54
(rabbit carcinoma transplanted into testis)
Nerves ↑ + *Carcinogen* in mouse
Raushenbakh et al B97214/52
(incidence of leucosis–induced)
Nerves (*conditioned reflex*) ↑ + Carcinogen in mouse
Kozhevnikova B97254/53
(growth of skin tumor–induced)
Hypoxia ↓ in mouse
Barach and Bickerman B99033/51
(growth of sarcoma transplant)
Carcinogen + Paraoxypropiophenone ↓ in rat
Robertson et al C6695/54
(hepatic carcinoma–induced)
Granulation tissue extract *in man*
Hammerschmid B99097/53
(various tumors)
Kressner B99095/54
(various tumors)
Isonicotinic acid hydrazide in rat
Vangelista B97257/53
(growth of tumor–transplanted)
Polysaccharides in mouse
Belkin and Wodinsky C4362/55
(sarcoma)
Serotonin in mouse
Pradhan et al C5282/55
(sarcoma–transplanted)
Shwartzman filtrate (*locally*)
Nagashima B97660/52
(regression of sarcoma hepatoma–transplant)
Thorotrast in rat
Bernard et al C1391/55
(Walker carcinoma–transplanted)

Tumor extract (polysaccharides) in mouse
Belkin and Wodinsky C4362/55
(sarcoma)
Yeast extract (systemically and locally) in mouse
Audier B98234/54 (transplants)
Starvation in mouse
Barwick and Goodson C2415/54
(sarcoma–transplanted)

Neoplastic Disease → Targets

Polysaccharides in blood ← Ionizing rays nitrogen mustard
Keyser C4008/52 (various)
Cholesterol in blood
Rochat and Schafter C2408/54
(carcinoma)
Cholesterol in blood ← *Pineal extract* ↑
Lenti et al B98731/54 (carcinoma)
Nitrogen in blood (C reactive protein glycoprotein *mucoprotein* γ *globulin*)
Shetlar et al C4135/55 (various)
Nitrogen in urine ← Hypophysectomy + STH + Adrenalectomy + Cortisone + Ovariectomy
Pearson C4986/55
(mammary carcinoma)
C reactive protein in blood
Sprunt and Hale C4413/55
(various)
NaCl *in urine* ← *Diurnal* variations + NaCl
Arborelius C3748/53 (carcinoma)
Calcium in urine ← *Hypophysectomy* + STH ↑ + Adrenalectomy + Cortisone + Ovariectomy
Pearson C4986/55
(mammary carcinoma)
Calcium in blood, urine ← Adrenalectomy + Cortisone ↓
Randall B96556/54 (mammary carcinoma–spontaneous)
Calcium in blood urine ← Cortisone ↓ + Ovariectomy
Randall B96556/54
(mammary carcinoma–spontaneous)
Phosphorus in urine ← Hypophysectomy + *STH* ↑ + *Adrenalectomy* + Cortisone + Ovariectomy
Pearson C4986/55
(mammary carcinoma)
STH in urine
Sanabria C4782/54 (carcinoma)
CTH in urine ← Pineal extract
Lenti et al B98731/54
(carcinoma)
MTH in urine
Shizume and Lerner C416/54
(carcinoma melanoma)

PART III

AFTERTHOUGHTS

ENDOTHELIOMYELOSIS—AN EXPERIMENTAL MODEL OF THE "FOCAL SYNDROME"

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As in the previous volumes of the AROS series we should like to consider in this last section those recent acquisitions in the field of stress which may help us to unify our concepts of disease During the current year much of our work was concerned with research of this kind in relation with the so called "focal syndrome" or "focal infection"

It had long been suspected that even without disseminating bacterial embolisms a localized focus of infection may produce widespread disease manifestations especially in connective tissue joints the cardiovascular system and the kidneys However clarification of this field has been greatly handicapped by three circumstances (1) in clinical medicine not every infected focus is accompanied by such distant manifestations (2) in experimental medicine no *reliable method* was available which would have permitted the *consistent* reproduction of the focal syndrome (3) even when a localized infection produces a generalized syndrome of this type the removal of the focus does not always result in a cure of the distant disease manifestations It was especially the lack of a reliable technique for the production of the focal syndrome that handicapped experimental research in this field It is extremely difficult to elucidate the pathogenic mechanism of a malady which cannot be reproduced in animals at will We have therefore endeavored to perfect such an experimental technique but before describing it let us briefly review the salient points which have come to light so far concerning the focal syndrome

Earlier Clinical Observations on the Focal Syndrome

Reviews The extraordinarily voluminous literature which deals with the problem of focal infection has repeatedly been reviewed (Goia B25571/46 Iskraut C6566/54 Lehmann C5858/31 *Reimmann and Havens C6848/40 Rosenow* C6847/30 Slocumb et al C6097/41) As we shall see there are close connections between this concept and the experimental syndrome of "endotheliomyelosis" which we are to discuss here

History Egyptian tables—which date back to 650 B C and were found in the ruins of Nineveh—mention a disease of the King Anapper Essa which

Cortisone+Pregnancy+Age in mouse
Fraser et al C244/54 (cleft palate)
Cortisone ? +Pregnancy+Age (foetal) in rabbit
Fainstat B98718/54
(induction of cleft palate)
Insulin+Pregnancy+Age (foetal) in man
Wickes B99709/54
Age (embryonic)+Serum (of cancer patients) in fowl
de Lustig C6353/54
Age (embryonic)+Vitamin E deficiency in fowl
Ferguson et al C2125/54
Stress in mouse
Fraser et al C244/54
(cleft palate—discussion)

Malformations → Targets

Anencephaly → Adrenals (histology) in man
Frazao C2809/54

that "undoubtedly there are cases of infectious arthritis which result from focal infections However as far as typical rheumatoid arthritis is concerned it would appear from this study that chronic focal infection plays a comparatively unimportant role (*Cecil and Angevine C6093/38*)

Another group of workers states that "in rheumatoid arthritis particularly it is wise to remove tonsils which seem diseased and to treat sinus infection not *because of any proven* etiological relationship but because anything which improves the health of these patients seems to help their arthritis" (Boots and McCollom C6092/42) For various other so called vegetative endocrine syndroms" which had been thought to result from focal infection this theory has likewise been rejected (*Feicreis and Karst C4571/55*)

Prevailing contemporary clinical opinion is perhaps best summarized by Cecil (A63152/43) in his *Textbook of Medicine* He says Many thoughtful physicians who originally accepted the theory of focal infection with enthusiasm have watched with interest and some trepidation its rapid development in the various fields of medicine and are now wondering if the time has not arrived for the re evaluation of the theory Many students today question seriously its validity and some are *quite willing to throw it completely overboard This is particularly* true in Europe where the idea of focal infection has never met with enthusiastic acceptance But even in America many practitioners are becoming a little weaned of the theory which has been accepted as if it were an established fact"

Earlier Experimental Findings

Animal experiments likewise failed to clarify this problem In the preceding section we have already mentioned the failure of modern investigators to confirm earlier claims of special bacterial mutations in infected foci that is changes which would result in the development of microbial strains having selective organotropic affinities

The greatest difficulty in analyzing this problem was that even those who had apparently obtained some such change as an endocarditis an arthritis or a nephritis in experimental animals in which bacterial foci had been produced could not repeat their experiments with any degree of consistency

However a search through the literature revealed a few rather interesting experiments which definitely deserve to be mentioned here

In *young guinea pigs endocarditis and/or arthritis had been occasionally* produced by daily subcutaneous injections of diverse materials including various mucopolysaccharides (some of them nonantigenic) cortisone histamine trypsin hyaluronic acid gastric mucin Friedlander s organism polysaccharides derived *from Friedlander s organism infection* with *Klebsiella* vitreous humor etc "Since the substances giving rise to the severer local response at the site of injection were associated with the more marked cardiac valvular lesions it is not impossible that such substances may act as proantigens" (Jones and Carter C5899/54) Similar endocardial and articular lesions have also been produced in guinea pigs by subcutaneous injections of crude polysaccharides from *Klebsiella pneumoniae* type B (Jones et al C5900/54)

In *rabbits sensitized with bovine serum* after subsequent repeated intravenous injections with a centrifuged pleural exudate (obtained by injection of turpentine in donor rabbits) "characteristic perivascular granulomata similar to the Aschoff

manifested itself by headaches and pains in the extremities This malady could not be influenced by any of the treatments known at that time yet it disappeared miraculously, soon after the royal patient had his teeth extracted upon counsel of his physician Arad Nani During the seventeenth century the French surgeon Jean Louis Petit in his *Traite des Maladies Chirurgicales* emphasized the pathogenic importance of dental caries in various systemic diseases He pointed out particularly that these maladies can be cured best by extraction of the infected teeth (quoted after Cora B25571/46)

As time went by many physicians noted that oral and tonsillar infections may cause disease manifestations in distant organs so that the discovery of this fact is certainly not new However it was the great merit of Billings (C6095/12) that — in his classical paper Chronic focal infections and their etiologic relations to arthritis and nephritis — he first formulated this problem with sufficient precision to bring it to the attention of the medical profession throughout the world Those interested in the early history of focal infection will find several excellent reviews of it in the literature (Gilmer C6094/12 Cora B25571/46 Lehmann C5858/31)

Definition According to Cecil (A63152/43) *focal infection* may be defined as a localized infection which presumably produces symptoms in other parts of the body and in which there are usually no demonstrable bacteria in the blood stream

Pathogenesis As for the mechanism through which the focal infection produces symptoms at a distance the opinions are divided but up to now the following theories have found adherents (1) that there is actually some *slight septicemia* in the sense that small numbers of microorganisms periodically enter the blood from the focus and cause symptoms at a distance by settling in other organs (2) that *bacterial toxins* though not the bacteria themselves enter the circulation from the focus (3) that the organism becomes *hypersensitive to chemical constituents* of germs enclosed in the focus (4) that symptoms at a distance are due to some *nervous* reflex (Cora B25571 46)

The production of rheumatic and rheumatoid changes by focal infection of the tonsils for example is most generally ascribed to hypersensitivity to certain strains of streptococci It is difficult to see however why the same streptococci rarely cause rheumatic lesions when they settle in other organs or when they produce septicemia

It is also difficult to account for the frequently selective effect of a focus upon one or the other distant organ (e g the endocardium the joints or the kidney) It had been claimed that within the focus bacterial mutations can occur (for instance in strains of streptococci) which induce a particular affinity for individual tissues Allegedly streptococci isolated from the oral cavity of patients suffering from diseases in certain organs produce lesions in the corresponding organs upon injection into animals due to this acquired selective affinity However these observations could not be confirmed (Lehmann C5858 31)

Although the concept of focal infection was widely acclaimed during the earlier part of this century several investigators pointed out that it lacks a solid foundation This was thought to be the case even as regards rheumatoid arthritis which was always considered as one of the most common consequences of infected foci Thus one systematic clinical enquiry into this problem led to the conclusion

that *undoubtedly there are* cases of infectious arthritis which result from focal infections However as far as typical rheumatoid arthritis is concerned it would appear from this study that chronic focal infection plays a comparatively unimportant rôle" (*Cecil and Angevine C6093/38*)

Another group of workers states that in rheumatoid arthritis particularly it is wise to remove tonsils which seem diseased and to treat sinus infection not because of any proven etiological relationship but because anything which improves the health of these patients seems to help their arthritis (*Boots and McCollom C6092/42*) For *various other so called* vegetative endocrine syndroms" which had been thought to result from focal infection this theory has likewise been rejected (Feiereis and Karst C4571/55)

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bodies of type C were usually induced in the myocardium" Depending upon the sequence of injection with horse serum and exudate various other types of Aschoff bodies have also been produced Hence it was proposed that rheumatic like cardiac lesions occur under the influence of antigen antibody reaction and biological substances present in the exudate (Hayashi et al C6082/55) Such lesions are frequently accompanied by a type of diffuse glomerulonephritis similar to that seen in acute rheumatic fever (Hayashi et al C6083/55) On the other hand the development of Masugi nephritis was actually inhibited by injecting pleural exudate prior to the administration of the anti rabbit kidney duck serum (Hayashi et al C6265/53) although rheumatic like lesions did occur about 14 days after the injection of the antisera This may aid in the investigation of the relationships between rheumatic heart disease and diffuse glomerulonephritis" (Hayashi et al C6083/55)

Also in rabbits cardiac lesions closely resembling those found in rheumatic fever have been produced by multiple successive skin infections with several serologic types of Group A streptococci However the authors were careful to point out that "among the random samples of rabbits subjected to the described experimental procedure only a small portion have developed these cardiac lesions" (Murphy and Swift B37498/49) Subsequent re examination of this problem confirmed the possibility of producing such lesions but the incidence was again very low Because of the morphologic similarity between these lesions in the rabbit and those characteristic of rheumatic fever in man the conclusion seems justified that common pathogenetic factors are operative in both this rabbit disease and in human rheumatic fever And it seems probable that among various factors the pathogenesis of both abnormal conditions is attended by altered host reactivity to Group A streptococci that had been induced by previous infection with these microorganisms (Murphy and Swift B54639/50) Single intra pharyngeal infections with Group A streptococci also may cause cardiac lesions in rabbits These occur within 24 hours and have therefore been ascribed to "a non immunologic mechanism" (Morse et al C8922/55)

It must be pointed out however that none of these authors performed suitable control experiments to prove that the changes are specific for Group A streptococci and could not be produced by other organisms In any event the impossibility of obtaining constantly reproducible results even with these streptococci stood in the way of using such techniques for a more systematic study of the mechanism of focal infection Yet one incidental observation may throw some light upon this point the rabbits which developed rheumatic like changes upon repeated inoculation with Group A streptococci also exhibited an unusual degree of adrenal enlargement (Murphy and Swift B37498/49 B54639/50)

Likewise in rabbits it was noted that repeated subcutaneous injections with various foreign proteins tend to produce a leukemia like syndrome which was ascribed to protein toxicosis (Pentimalli C4955/29 B99091/53) Here possible relationships to the focal syndrome have not been considered Yet it is obviously impossible to be certain that the repeated subcutaneous injections of foreign proteins acted merely by virtue of their direct systemic effects and not through the formation of pathogenic foci

As far as we were able to determine no one has ever attempted to produce any experimental simile of a focal infection in the *rat* In the course of our studies with the transplantable Walker tumor No 256 we often noted the development of

ectopic myelopoiesis especially in the adrenals This was usually accompanied by an enormous hypertrophy of the spleen (McEuen and Selye 38857/34 36705/35 Selye B94629/54) *At first sight these findings may appear to be quite unrelated* to the problem of focal infection but as we shall see later similar myeloid in filtrations have also been produced in connection with the syndrome of endo theliomyelosis which we are to describe in this article

Finally numerous experiments of Speransky and his School (for lit cf Speransky B18362/43) allegedly showed the possibility of producing various types of focal "neurodystrophic disturbances" in distant organs by the experi mental introduction of croton oil into the dental pulp of *dogs* This was ascribed to disturbances resulting from irritation of the dental nerves However in sub sequent attempts to repeat these experiments no change was obtained other than local reactions (gingivitis dental granuloma) at the site where the croton oil was applied (Wawersik and Struck B96421/53)

It is not within the scope of this survey to discuss all experimental attempts to produce — quite independently of the focal syndrome — rheumatic fever or nephritis by the injection of microbes viruses foreign proteins etc However an excellent review of this field by Murphy (C8915/52) shows how inconsistent and confusing the results have been Although nephritic and/or rheumatic fever *like lesions have occasionally been produced by various methods it has been* impossible to devise a technique which would induce such lesions with absolute regularity Furthermore authors interested in this type of study generally neglected the possibility that topical tissue reactions at the site of the injections may have played a decisive role in the pathogenesis of the lesions obtained

Personal Observations

In one of our experiments designed to analyze the manifestations of STH overdosage the hormone was administered in Freund s adjuvant (as distributed by Difco Laboratories) This is made up by mixing 8 5 ml of "Bayol S (a light paraffin oil) with 1 5 ml of Arlacel A (Mannide monooleate) The resulting product is called incomplete adjuvant this mixture can be transformed into the complete adjuvant by the addition of 5 mg of heat killed *Mycobacterium butyricum For various serologic experiments it is advantageous to mix thoroughly* an aqueous solution of a vaccine or antigen with equal parts of this adjuvant thus obtaining an emulsion of an aqueous within an oily phase

When so administered — either due to an increased antigenic effect or merely because of delayed absorption — various serologic and hypersensitivity responses *can be obtained more readily than if the same material were merely* injected as an aqueous solution or suspension

We treated a large *series of female Sprague Dawley rats — consisting of groups* of no less than 10 animals (average body weight 160 Gm) for each dose level — with daily subcutaneous injections of 1 to 4 mg of STH administered in 0 2 ml of the *adjuvant* water *emulsion The animals* were conditioned for STH over dosage by unilateral nephrectomy and the substitution of 1 per cent sodium chloride instead of drinking water because our object was to see whether the *above mentioned* STH overdosage syndrome could be obtained more readily if the hormone preparation were given in adjuvant rather than in water

Under these circumstances STH given either in complete or in incomplete adjuvant caused marked local irritation At the same time virtually all animals receiving 2 mg or more of STH per day developed within 15 to 20 days, a syndrome of polyuria, renal and cardiac lesions, hypertrophy of the spleen with intense myeloid tissue proliferation and adrenocortical enlargement In these respects the changes were similar to those produced by subcutanous injections of STH in water However the organ changes developed much more rapidly and the cardiac lesion was not so much a myocarditis with periarteritis but rather an acute proliferative parietal and valvular endocarditis The most striking changes were the results of endothelial proliferation (especially in the endocardium and the renal glomeruli) and of myeloid tissue growth (especially in ectopic locations e g the spleen renal pelvis, adrenals) For lack of a better name we therefore propose to refer to this syndrome provisionally as an endotheliomyelosis The adrenals of rats exhibiting this syndrome were enlarged and the cortical cells became replete with hyalin, PAS positive cytoplasmic granules In view of the pronounced inflammatory changes elicited by STH when so administered this picture of endotheliomyelosis reminded us of the focal infection syndrome, but we had no definite evidence of an actual infection

Agents Capable of Eliciting the "Syndrome of Endotheliomyelosis" In order to determine the specificity of this reaction we then administered a 2 to 4 mg /day of *hypertensinogen globin casein horse serum bactopeptone and gamma* globulin under *similar conditions in Freund's incomplete adjuvant Globin, casein* and *hypertensinogen* also *produced a similar syndrome of endothelio* myelosis while the other substances already mentioned were *ineffective It was* striking however that the *compounds which caused the most* pronounced local reaction at the site of injection were also most *effective in producing* cardiovascular renal and adrenal changes

We then repeated similar experiments using *lyophilized thymus lyophilized liver* and *lyophilized spleen* tissue of calves (always at the daily dose of 2 mg in 0 2 ml of Freund's *incomplete adjuvant) All* these substances proved to be effective in producing the syndrome while trypsin and thyroxin were *ineffective Here again all the substances which elicited* changes in distant organs also produced a marked local inflammation Trypsin at the high dose used caused instant dissolution of the tissues resulting in large open wounds at the site of injection but no actual inflammatory reaction *correspondingly it failed to elicit the syndrome of endotheliomyelosis*

We then wondered whether the adjuvant *is really indispensable To verify this* we administered *kaolin* (20 per cent in water) *mustard powder* (20 per cent in water) *formalin* (4 per cent in water) *croton oil* (5 per cent in sesame oil) Again all these substances were given daily subcutaneously in 0 2 ml of solvent to groups of at least 10 female Sprague Dawley rats (average body weight 160 Gm) sensitized by unilateral *nephrectomy* and sodium chloride supplements All these irritating substances *produced marked local inflammatory changes* at injection sites However although in some animals of each group the syndrome of endotheliomyelosis developed in a characteristic way the incidence was much less regular than in the previous experimental series in which various protein solutions (STH casein globin lyophilized tissues) were administered in Freund's adjuvant It therefore *occurred to us that perhaps accidental contamination of* the protein solutions (which are better media for microorganisms) may have been

of pathogenic importance It is evident that if the same protein solutions are constantly used for daily injection they can readily become contaminated with microbes carried by the injection needles from the rats into the solutions This view received further confirmation from the subsequent observation that protein solutions left open in the laboratory for a week or more became extraordinarily effective in producing endotheliomyelosis at the same time when they began to undergo putrefaction This would also explain the fact that administration of any *of these solutions in Freund s adjuvant greatly increases their efficacy in producing* the syndrome since it had long been noted that various effects of different micro organisms are increased if the germs are administered in adjuvant

So far it has not been possible to reproduce the syndrome of endothelio myelosis with any one microbe administered in pure culture (even if given in Freund s adjuvant) It is possible that we have not used the most effective germs or that mixed infection with various types of bacteria is necessary in order to produce the syndrome We hope to report shortly on the bacteriologic aspects of the problem (now under systematic study in cooperation with Dr Paul Dionne) so that we need not go into these questions further here At this time the accidental contamination through the needle used for the injection of the we merely wish to outline a reliable technique for the experimental production of endotheliomyelosis and we wish to describe the salient clinical and morphologic features of this type of focal syndrome

Standard Technique for the Production of the Syndrome Although as already outlined endotheliomyelosis can be produced in various ways we eventually adopted the following technique as the simplest and most reliable procedure which in our experience constantly resulted in the classical syndrome (endo carditis ectopic myelopoiesis PAS positive granules in the adrenals polyuria and nephritis)

Female Sprague Dawley rats with an initial body weight of about 100 Gm are unilaterally nephrectomized and henceforth given exclusively 1 per cent sodium chloride as a drinking fluid Immediately after the operation they receive daily subcutaneous injections on the back of 0 2 ml of a 4 per cent casein solution thoroughly mixed with equal volumes of Freund s adjuvant This solution is placed in a bottle provided with a rubber stopper and material is withdrawn from it for injections daily without sterility precautions Under these conditions rats invariably caused a typical syndrome of endotheliomyelosis in all animals within 10 to 15 days The first clinical manifestations of it were the development of local nodules at the injection sites polyuria and dyspnea with cyanosis of the skin

Apparently solutions thus prepared for injection represent an ideal medium for the development of the kind of microbial flora which is most reliably conducive to the development of endotheliomyelosis Although it has not yet been possible to characterize this flora fully the technique gives more reliable results than any other procedure in which the injected material is subject to a more rigid control Such purely empirical procedures do not appeal to the scientific mind However until we learn more about the mechanisms which induce activity in such protein adjuvant solutions we shall have to be content with this technique merely because it gives the best results It must be remembered that *the mixture so successfully* developed by Freund as an adjuvant of serologic reactions is also based on pure empiricism and this did not detract from its value in medical research

Description of the Syndrome The most constant and pronounced lesions of endotheliomyelosis were those seen in the *endocardium* Here inflammation with intense cellular proliferation and edema developed both in the valves and in the lining of all cardiac cavities particularly in the auricles Many of the proliferating cells exhibited the characteristics of Anitschkow's caterpillar cells There was also a great tendency toward erosion of the surface endothelium with hyalin necrosis and fibrinous thrombus formation This endocarditis leads to marked dyspnea and cyanosis All these changes are very similar to those seen in man during severe acute rheumatic fever They differ rather sharply from the cardiac lesions produced by STH (in water) or by DOCA in similarly conditioned rats These hormones as well as the "endocrine kidney" operation rarely cause endocarditis, but tend to produce hyalinized myocardial nodules surrounded by granuloma cells, as well as periarteritis nodosa of the heart On the other hand in the syndrome of endotheliomyelosis such myocardial and periarteritic lesions are rarely seen and if they occur they develop only during the chronic stage, when the acute endocardial lesions are beginning to heal

In the *kidney* we noticed a marked dilatation of the convoluted tubules often with hyalin cast formation and enlargement of the glomeruli The glomerular capillaries were dilated and frequently contained PAS positive hyalinized material Great cellularity and swelling of the endothelial cells were also evident in most of the renal corpuscles Less frequently we observed infiltrations with inflammatory cells in the glomeruli as well as in the stroma around the tubules These changes are suggestive of an early nephritis they are usually accompanied by marked *polyuria*

Very characteristic changes were also observed in the *adrenal cortex* Here hyalin eosinophilic PAS positive granules accumulate within the cytoplasm, especially in the outer fasciculata and glomerulosa layers These granules are very similar to those previously produced with various steroids, particularly methylandrostenediol (MAD)

Occasionally individual cells in various parts of the adrenal cortex tend to become more diffusely impregnated with slightly PAS positive material and then they undergo necrosis Sometimes larger foci of necrosis are detectable in the adrenal cortex and these may be of sufficient dimensions to be macroscopically visible After 20 days or more islets of myeloid tissue tend to develop especially along the cortico medullary borderline

In the *spleen* the great predominance of myeloid elements and a considerable proliferation of megakaryocytes are especially striking

The *liver* tends to be enlarged and may occasionally also contain small foci of myeloid tissue The sinusoids and veins of the liver show signs of pronounced stasis

A *noma like progressive ulcer* developed occasionally around the upper incisors of the rats together with a more diffuse inflammation of the oral and nasopharyngeal mucosa

During certain periods of treatment *fever* (up to 104 F) was noted in many of the animals

The *serum polysaccharides* (determined by the method of Shetlar et al B53469/48) were markedly elevated (270-400 mg/per cent as compared with 155 190 mg/per cent in the controls) in one characteristic group treated with contaminated casein This is interesting because the PAS positive granules in the adrenals are also presumed to be polysaccharides

The *sites of injection* invariably showed a central focus of necrosis surrounded by *a marked inflammatory reaction Necrotic foci were absent or inconspicuous* only when STH was used to elicit the syndrome of endotheliomyelosis

The Dynamics of the Syndrome The next problem will be now to elucidate the dynamics of this syndrome Its most characteristic components are (A) endocarditis (B) nephritis like renal lesions (C) adrenal changes which are rot merely nonspecific manifestations of stress e g PAS positive granules and (D) a marked tendency for ectopic myelopoiesis especially in the spleen adrenals and liver

Most probably further work will show other manifestations which likewise belong to this syndrome but even these four very characteristic and constantly reproducible lesions can serve as a useful basis for the experimental analysis of the interrelations between them

The problem is very similar to that with which we were confronted when we began our work on the G A S At that time the classical triad" of the alarm reaction (A) adrenocortical enlargement (B) thymicolymphatic involution and (C) gastrointestinal ulcers served as a basis for the analysis of the stress syndrome It helped us to elucidate part of the underlying mechanism although subsequent studies showed many other changes which likewise belong to the G A S

With regard to the syndrome of endotheliomyelosis this type of analytic work has merely begun However a few interesting facts have already come to light These may be summarized as follows

(1) It has been possible to show that in rats not sensitized by unilateral nephrectomy and an increased sodium chloride intake focal infection is still capable of producing endocarditis and myeloid tissue proliferations but the renal lesions are much less evident and there is no or only very slight polyuria

(2) As might be expected adrenalectomized animals are extremely sensitive to focal infection and mortality among them is high even if comparatively large doses of corticoids are given as substitution therapy In maintaining life COLA is much more effective than DOCA and the best results are obtained by com bined treatment with COLA + DOCA Apparently both mineralo and gluco corticoids play important rôles in maintaining the resistance of animals so treated Yet in our experience even combined administration of the two types of corticoids did not equal the efficacy of intact adrenal tissue since it never succeeded in restoring the resistance of adrenalectomized animals to the high tolerance level of *intact rats It is possible that hormones and other than DOCA* and COLA like substances are necessary for optimum resistance Perhaps the characteristic PAS positive granules in the cortical cells of rats with the focal syndrome reflect the biosynthesis of some special corticoid

(3) In animals with intact adrenals STH greatly facilitates the production of endotheliomyelosis by various agents



Cardiac changes in endotheliomyelosis *A* Low magnification of mitral valve on the twelfth day of treatment with 4 mg /day of contaminated casein in adjuvant Both leaflets of the valve are greatly swollen due to endocardial vegetations A hyalin thrombus is in the area delimited by a square *B* High magnification of the partly hyalinized fibrinous deposit in the area delimited by a square in the preceding picture *C* Periarteritis nodosa with ring shaped hyalin deposits in the intima of various cardiac arteries in a rat treated with 2mg /day of contaminated globin in adjuvant for 13 days and killed 10 days after the last injection *D* High magnification of an artery from the heart in figure C Note intense hyalin deposition on one side of a small arteriole



Cardiac, renal, and adrenal changes in endotheliomyelosis. *A*, Typical Anitschkow or caterpillar cells from the connective tissue near the aortic valve of the heart. *B*, Nephritis. Note greatly enlarged and inflamed glomeruli with accumulation of proteinaceous material in Bowman's capsule and numerous hyalin casts. *C*, Myeloid infiltrations at the cortico-medullary junction in the adrenal. *D*, PAS-positive granules in the outer fasciculata of the adrenal. A cell with a particularly large granule (top arrow) and one containing two small granules (bottom arrow) are specially marked. (All tissues on this plate come from rats treated in the same manner as that shown in figure C in the preceding plate.)

(4) The structure of the pathogenic focus is obviously of the greatest significance. This is clearly indicated by the fact that various contaminated protein solutions, which are ineffective when injected subcutaneously as such become highly efficacious when administered with adjuvant. It is also noteworthy that even sudden flooding of the blood with such contaminated proteins, by intravenous injection does not elicit the syndrome of endotheliomyelosis; it merely produces multiple abscesses as a result of septicemia. This is particularly noteworthy since the only other reliable means for the production of acute endocarditis in the rat is the injection directly into the blood of various types of streptococci. Even these germs produce endocarditis with any degree of regularity only after intracardiac inoculation (Clawson 93366/45, B93770/53), when injected intravenously endocarditis is only obtained if the animals are previously exposed to high altitude, a procedure which can produce some degree of endocardial damage in itself (Highman et al. C8996/54).

(5) A great deal of evidence has been accumulated in the literature to show that Group A hemolytic streptococci play a specific role in producing rheumatic fever and cognate lesions in man and in experimental animals. In this respect, it is significant that although our contaminated protein solutions contained a variety of microorganisms (*Escherichia coli, Achromobacter, Pseudomonas pyocyanea, Klebsiella, Proteus, Paracolobactrum*) it was impossible to demonstrate the presence of any streptococci in our most active preparations.*

(6) The distant effects of a pathogenic focus may outlast its existence. As we said before periarteritic changes may develop after discontinuation of a transitory treatment with contaminated casein. Occasionally we also noted that polyuria may continue indefinitely after the contents of an infected focus are eliminated through the skin and nothing but a scar remains. Such vascular and renal changes are then truly "metafocal" in the same sense as certain cardiovascular and renal changes developing after discontinuation of a transitory corticoid treatment are "metacorticoid."

All these data clearly indicate that the structure of the infected focus plays a decisive role in determining whether the syndrome of endotheliomyelosis will result from infection or not. We may therefore conclude that in this syndrome we have a true simile of a type of focal infection. Up to now our main endeavor was to develop an experimental technique which permits the consistent reproduction of a focal syndrome. This has been accomplished but our procedures are still largely empirical. Further work will now have to show what pure microbial cultures or microbial products are capable of producing such systemic reactions, what topical adjuvant procedures are most efficacious and what host responses (hormonal reactions, serologic responses, etc.) are involved in the pathogenesis of the focal syndrome.

*We are greatly indebted to Dr. Paul Dionne for the identification of these microorganisms.

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MD Publications, Inc., have done everything in their power to overcome the innumerable technical problems which present themselves in connection with the editing, composition and printing of such a complicated text as this their whole-hearted collaboration was particularly important since the book had to be prepared in great haste to make it a truly up to-date guide to current literature

INDEX

Most of this volume is essentially an Index arranged in a significant order The following pages are not meant to duplicate but rather to complement the preceding sections by alphabetically arranged cross references

In the body of the report the "statements of topic" i e abridged indications of the subject which formed the basis of each investigation as outlined on p 211 and our comments about them if any are arranged according to the "targets" as listed in the Table of Contents (p 5) In this Index the principal entries (as well as topics which have been the subject of special discussions) are distinguished by block numerals (e g **12***) No further subdivision is needed for each target in the index since by turning to the corresponding page the reader will automatically find all the data concerning factors which influence this target*

(For instance nothing would be gained by listing in the "Pancreas" section of the Index all the 20 experimental conditions whose effects upon the pancreas are outlined on p 445 as the reader would in any case upon turning to this page find them On the other hand each of these factors is listed in its own alphabetic position (e g under ACTH hypophysectomy cortisone) since there is no one section in this book to which the reader could refer for all the data on any one of these factors)

Data concerning the effects of various agents upon the entire course of spontaneously occurring diseases of man are listed as if the disease were a single "target" However selective effects upon certain receptors in patients with such diseases are separately indexed taking these receptors themselves as a target

(For instance on pp 500 502 the reader will find all those agents which affect rheumatoid arthritis as a whole while the text immediately following lists the response in such patients of basal metabolism blood sugar etc Correspondingly in the following Index *the reader will find not only the main section devoted exclusively to the basal metabolism rate but also* (cross indexed) all the other data which refer to basal metabolism blood sugar etc more incidentally e g in connection with a spontaneous disease These minor listings are given in ordinary numerals (e g 12))

Thus it was possible to make certain that through this Index one could find all data in this book referring either to targets or to the factors influencing them

Greek letters (e g α β γ Δ) numbers which form part of indexed words and short connecting words (e g the for of from to as) are omitted in determining the alphabetic position of entries in this Index

When a target A *is influenced by a stimulus* B *this is indicated by an arrow pointing from* B *to* A *thus* B → A *instead of the usual entry* "A *effect by* B *upon" which is both space consuming and poor English*

The letters L *and* R *placed after a page number refer respectively to the left and right column of the text*